A Gender Quota for Top Executives: Effects on Diversity and Performance

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Abstract

We study Germany's landmark quota requiring major public companies to hire a female top executive. We find that the quota significantly increased top executives' gender diversity at targeted firms. Firms drew new women primarily from outside of their leadership ranks and professional networks without significantly sacrificing candidate experience. The new female executives were primarily recruited into HR and less common board roles. Although stock market returns show a negative response to the initial call for a quota, this pattern reversed as the quota was codified into law, and we find no discernable lasting effects on firms' operating profit or market valuation.

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I. Introduction

Although female representation among top business executives has been trending slowly upward in recent decades, men still account for over 90% of CEOs at Fortune 500 companies (Catalyst, 2023) and at top listed companies in Europe (EIGE, 2025). In August 2021, Germany become the first country in the world to adopt a gender quota for corporate executives, requiring large German companies to include at least one woman on their top executive teams. This quota was implemented following what were perceived as largely ineffective governmental attempts to expand women's representation in top executive jobs through indirect means, such as gender quotas for supervisory boards or policies requiring companies establish their own nonbinding targets for top executive diversity.[1] Compared to other public policies aimed at improving gender diversity, such as antidiscrimination laws and affirmative action requirements,[2] the German quota is remarkably interventionist. It is unusual in its targeting of high-ranking executives and in the severity of its consequences for noncompliance, barring companies with no female top executives from appointing male top executives.

In this paper, we measure the effects of this novel type of gender policy along three key dimensions. First, we assess if the German quota succeeded in raising the female share of top corporate executives. Second, we examine what hiring strategies firms employed to satisfy the unprecedented mandate. Third, we analyze how the quota affected companies' stock prices and performance. We evaluate these three effects of the quota by estimating difference-in-differences comparisons between German firms targeted by the quota and two sets of control companies: other

[1] Companies were granted significant latitude in setting their targets and timelines for achieving them, and a 2020 report on the policy by the advocacy group FidAR found a significant majority of companies set their initial targets for female presence among top executives at zero (FidAR 2020).

[2] In the US from September 1965 to January 2025, federal government contractors were required, under Executive Order 11246, to take affirmative action such as "training programs, outreach efforts, and other positive steps" to "recruit and advance qualified…women" (DOL 2024).

firms in Germany and comparable companies elsewhere in Europe. We use the control firms to account for business cycle fluctuations and secular trends in female leadership.

Our first finding is that the quota significantly increased gender diversity in top corporate positions. Despite showing similar trends in the three years preceding the quota's announcement, the female share of top executives at quota-targeted German companies increased by 6 percentage points, relative to both sets of control companies, over the following 3-year period. This change represents a two-thirds increase relative the 9% female top executive share at quota-targeted companies in 2019. Similarly, the share of targeted companies with any female top executives increased by over 20 percentage points to an average of 87% in 2023.[3] The female share of new top executive appointments increased by over 20 percentage points at targeted firms, a magnitude that exceeds the average female share across all new appointments in the sample period. The share increased by about 40 percentage points when the appointing company had no female top executives in place and the quota's minimal participation requirement was binding.

Our results show that the mandatory gender quota we study is exceptional among gender policies in that it substantially increased gender diversity among top executives. This contrasts with previous gender policies that have shown limited effects on women's advancement to top leadership jobs. Supply-side policies, such as paid maternity leave and subsidized childcare provision have not improved career advancement for working women (Lalive et al. 2014, Ginja et al. 2023; Thomas 2021; Kleven et al. 2024). Neither have broad-based antidiscrimination policies.

[3] Despite full compliance with the quota's rule for new appointments, this rate is less than 100% of targeted companies for two reasons. First, we use an intent-to-treat measure to define targeted companies, and some companies stopped being bound by the quota because they reduced the size of their top executive team, as the quota only applied to companies with at least four people in their top executive team. Hugo Boss, for example, reduced its count of top executives to three, just below the quota's threshold, after the quota was enacted, and had yet to appoint a female top executive by the end of the sample period. Second, the quota only applies at the time of new appointments. Thus, even among continually targeted firms, variation in the timing of new appointments and the departures of female top executives allows companies to have spells with all male top executive teams.

The wage gains that accrued to women from the Civil Right and Equal Pay Acts of the 1960s were concentrated in the lower half of the pay distribution (Bailey et al. forthcoming). Studies of affirmative action have similarly not detected effects on women's promotion rates or representation in management (Leonard 1984; Holzer and Neumark 2000a; Carrington et al. 2000; Kurtulus 2016; Miller 2018; Miller and Segal 2012).

Our examination of new appointments further reveals that targeted firms primarily recruited new female executives from outside of the company and its leaders' professional networks. The reduction in male appointments was concentrated among unconnected outsiders, so complying with the quota did not result in an overall shift in the shares of unconnected outsiders appointed to executive boards. Although the quota increased female presence on the top executive team, it did not detectably increase the likelihood of women serving in CEO, CFO, or COO positions. Rather, targeted firms recruited female executives into a limited set of functional roles. The new female top executives were concentrated in human resources and labor relations roles, which also had greater female representation before the quota, and in less common top executive roles, such as divisional COO or head of sustainability.

After establishing that firms appointed more women to top jobs in response to the quota, we next explore the impact of those appointments on director quality and firm performance. A binding quota that increases hiring of female top executives would be expected to reduce match quality and profits if firms were optimizing before it came into effect and they complied by bypassing more qualified men. However, this effect can be offset or reversed if the pre-quota hiring process was tainted by explicit or implicit gender bias.[6] The economic theory literature on

[6] Empirical research on affirmative action in the US federal contractor program has not generally found significant efficiency effects, in either direction (see, e.g., Leonard 1984, Holzer and Neumark 2000a, 2000b). In a setting where affirmative action was imposed following litigation alleging discrimination in hiring, Miller and Segal (2019) find

affirmative action in employment identifies a variety of scenarios under which quotas can improve efficiency, but many of those mechanisms are unlikely to apply in our setting because they depend on changes in human capital investment and mentoring that emerge only over time (e.g., Lundberg and Startz 1983; Coate and Loury 1993; Athey et al. 2000; Moro and Norman 2003; Chaudhuri and Sethi 2008; De Sousa and Niederle 2022; Müller-Itten and Aniko Öry 2022). The main factor the literature identifies that could quickly mitigate, and potentially even reverse, reductions in new hire quality is the quota's potential to expand the pool of high-quality female candidates (Niederle, Segal, and Vesterlund 2013).

When we proxy for the quality of newly hired top executives with measures of prior experience in corporate leadership, we find no significant effects of the quota. The point estimates suggest small reductions in average experience levels, but these are not statistically distinguishable from zero. That firms were able to increase diversity without lowering experience levels may be related to our finding that the new female executives were mainly unconnected outsiders, which is consistent with firms drawing from an expanded pool of female candidates, rather than digging deeper into their usual candidate pool.

Consistent with the quota's lack of an impact on top executives' quality, we also do not find significant effects on corporate profits. The estimated effects differ in sign across time periods, samples, and specifications. The stock market valuation of targeted companies, a measure of long-term profitability, fell in reaction to the quota's development, but recovered as details of the quota were formulated and adopted. Taken together, these results indicate that the quota, as implemented,

evidence of quality improvements. In politics, Besley et al. (2017) find the introduction of a gender quota by a Swedish political party for its candidate list improved the average competence of politicians and Casas-Arce and Saiz (2015) find compliance with a Spanish gender mandate improved electoral outcomes for affected parties.

significantly expanded gender diversity in leadership without imposing the economic harm that investors initially feared.

To the extent that our findings apply more broadly, they suggest the possibility of increasing women's top executive presence in other companies and countries without lowering profits. At the same time, the lack of any immediate benefit in valuation or profitability suggests that the quota also did not appreciably improve match quality by removing barriers to women's appointments to top executive positions. The lack of a clear financial benefit from hiring women to top executive positions, together with the initial negative stock market reaction to the quota's development, could help explain why firms avoided doing so, even under Germany's quota for supervisory directors and its voluntary target system for executives. Firms had little motivation from market forces to overcome the inertia in their hiring practices and incorporate more women. Only under direct external pressure, in the form of the executive quota, did firms change their practices.

These findings contribute to the labor economics literature on gender gaps in top corporate jobs (Bertrand and Hallock 2001; Goldin 2014; Wolfers 2006; Smith et al. 2013) and at the high end of the earnings distribution (Blau and Kahn 2017). Prior work has focused primarily on barriers to female progress, including household obligations, especially following motherhood (Bertrand et al. 2010; Miller 2011; Gicheva 2013; Cortes and Pan 2019), preferences against risk and competition (Niederle and Vesterlund 2011), and institutional factors, such as limited access to mentors (Athey, Avery, and Zemsky 2000) and lingering gender bias or discrimination (Becker 1957, Charles et al. 2022).[7] By contrast, this study examines the impact of a government policy that forced firms to appoint women to top leadership positions.

[7] Experimental studies of discrimination typically focus on entry-level jobs for new graduates (Kessler et al. 2019) or hiring for lower-level jobs with large and anonymous candidate pools (Kline et al. 2022).

Our analysis also relates to the literatures in corporate governance and political science that study gender quotas for political leaders and companies' supervisory boards. Gender quotas in politics (including voluntary party quotas, candidate quotas, and reserved seats) have a longer history and more widespread adoption than board quotas (Pande and Ford 2011; Miller 2018). While political quotas are not always effective in increasing female representation among elected leaders (e.g., when used for party lists, Esteve-Volart and Bagues 2012; Bagues and Campa 2021), reserved female seats in India have been shown to shift public goods spending (Chattopadhyay and Duflo 2004) and to improve women's success in future electoral contests (Beaman et al. 2009). Gender quotas for companies' boards of directors are themselves a recent innovation, having been introduced in Norway in 2005 and since spread to countries including France, Italy, Belgium, and India. Although the Californian gender quota was overturned as illegal sex discrimination (*Crest* v. *Padilla*, Cal. Super. 2022), board quotas have continued to expand, including the adoption of an EU-wide quota in 2022, and they enjoy popular support in many countries (Bursztyn et al. 2023).

Because supervisory boards' responsibilities include the appointment and oversight of top executives, gender quotas for boards could be an *indirect* way to increase gender diversity among top executives. Although prior research has found evidence of gender spillovers from board members to top executives and from higher to lower ranking private-sector employees in a variety of settings (e.g., Flabbi et al. 2019, Kunze and Miller 2017, Tate and Yang 2015, Matsa and Miller 2011), evidence of those spillovers has been more elusive under quotas. Pan-European analysis finds no evidence of supervisory board gender quotas spilling over onto gender diversity in the top executive ranks (Matsa and Miller, forthcoming). Most country-specific studies also find no effect (Bertrand et al. 2019, Maida and Weber 2022).[8] These scholarly findings are consistent with the

[8] The French supervisory board quota is an important exception (Ladant and Paul-Delvaux 2023).

German experience where the limited gains for female top executives following the 2016 quota for supervisory boards was the major impetus for the adoption of the quota we study, which instead aimed directly at top executives.

II. Background and Data

II.A The German Quota for Top Executives

In November 2020, Germany's coalition government announced its intention to "introduce a mandatory quota for the number of women working as senior management in the country's listed companies" (Goodley 2020).[9] The draft text of the law, the Second Leadership Positions Act (henceforth, the quota law),[10] was introduced in January 2021; it passed the Bundestag (lower house) and Bundesrat (council of states) in June 2021; and was enacted into law in August 2021, affecting new top executive appointments starting in August 2022.

The law leverages German companies' existing two-tier board governance structure to designate the top executives subject to the quota. Each company has two distinct formal boards: a management board and a supervisory board. The management board, which is chaired by the CEO, is staffed by executives working full-time for the company. These executives, who are subject to the quota we study, oversee the day-to-day running of the business and are akin to the senior executive team of a US company.[11] The supervisory board, which is most comparable to the board

[9] Press coverage of the announcement describes it as "a move hailed as a 'historic' step towards sexual equality in German boardrooms" (Goodley 2020).

[10] The first Leadership Positions Act (FüPoG), passed in 2015, established a mandatory gender quota for supervisory boards and created a system for firms to set voluntary gender targets for top management positions (including both the top executives who were later subjected to the quota and one layer below). The full name of the first law is (in translation) "Act for the Equal Participation of Women and Men in Leadership Positions in the Private and Public Sector" and the second is "Act to Supplement and Amend the Regulations for the Equal Participation of Women in Management Positions in the Private Sector and the Public Sector."

[11] The German Corporate Governance Code (Deutscher Corporate Governance Kodex, or DCGK, available online at https://dcgk.de/en/home.html) provides detail on management board duties and obligations.

of directors of a US company, is composed of non-executive directors, who supervise the management board and ensure that the company's operations are conducted in the best interests of the company and in accordance with legal and ethical standards.

The law institutes a "minimum participation requirement" requiring that at least one of the executives serving on the management board of each targeted German company be female. The law targets companies that are publicly traded, subject to parity codetermination, and have management boards with at least four members. Parity codetermination refers to the requirement that the largest companies in Germany include equal numbers of employee and shareholder representatives on their supervisory board.[12] Targeted companies with all-male top executives fail to meet the minimum participation requirement and are barred from appointing any new top executives until they achieve compliance by appointing a female top executive. Appointments made in violation of the rule are legally void. In practice, this penalty and enforcement mechanism mean that the requirement is only binding on firms at the time that they make top executive appointments. Because firms are not required to immediately replace departing top executives, regardless of their gender, a small share of targeted firms can have no female top executives at any point in time, even if the law is strictly enforced and all new appointments adhere to its requirements.

[12] Companies with more than 500 employees are subject to a codetermination requirement of one-third worker representation on the supervisory board. Those with more than 2,000 employees (or 1,000 in mining and steel industries) are subject to parity codetermination. The effects of codetermination on wages and firm outcomes in Germany are examined in Jäger et al. (2021) and Jäger et al. (2022). Companies subject to codetermination were also targeted for supervisory board quotas under FüPoG.

II.B Data and Estimation Samples

In our empirical analysis, we compare quota-targeted companies to two samples of comparison companies for the period between January 2016 and May 2024. Companies subject to the gender quota for top executives are identified using the research and advocacy organization FidAR's "Women on Board Index" reports from 2021 through 2023.[13] We take an intention-to-treat approach and consider firms to be targeted if they were subject to the law at any point, which includes companies that reduced their board size following the passage of the quota law.[14]

Our first comparison sample includes all public companies in Germany with multimember top executive teams, while the second contains all large public companies in Europe with dual-board structures and multimember executive boards.[15] The comparison within Germany allows us to hold constant economic, political, and social factors that vary across countries and may affect our outcomes of interest. However, because the quota was intentionally imposed on the largest and most prominent firms in Germany, other German companies are necessarily smaller and less prominent. The second comparison is to large and prominent companies with dual board structures located anywhere in Europe. These companies are mostly based in Denmark, France, Italy, and

[13] The name FidAR is a contraction of Frauen in die Aufsichtsräte, or women in supervisory boards. Reports are available online at https://www.fidar.de/.

[14] This measure understates the treatment effect of operating under the gender quota if firms intentionally avoided the quota by changing their status. Out of 72 firms ever subject to the quota, we observe 6 with consistently all-male executive boards through the end of our sample period. Four of those six firms were no longer targeted by the quota in 2023, because two delisted (Bauer AG and ElringKlinger AG) and two dropped down to three top executives (Hugo Boss and Rhön-klinikum AG). The remaining two firms (Wüstenrot & Württembergische AG and Koenig & Bauer AG) remained subject to the quota but had not yet appointed a new top executive since the quota's effective date. Overall, 10 firms in the targeted group were no longer bound by the quota in 2023 and 6 firms affected in 2023 were not initially targeted.

[15] We identify companies' board structures from the European Federation of Employee Share Ownership (EFES) survey, which includes all listed companies with a stock market capitalization of at least 200 million Euros. Companies in many European countries have a choice of adopting unitary (single-tiered) versus dual (two-tiered) board structures. See Belot et al. (2014) for an analysis of the tradeoffs and implications of these choices in France.

the Netherlands.[16] A second advantage of the pan-European comparison group is that it is not subject to concerns about cross-firm spillovers within Germany, e.g., the possibility that smaller firms might mimic leading companies in addressing gender diversity.

For each targeted and control firm, we collected information from Boardex, which compiles publicly available information, including from firms' disclosures, on individuals who currently hold or historically held positions as an executive board member, a supervisory board member, or a senior manager not on the executive board. For these individuals, we obtained data on their gender and the full history of their corporate leadership roles, including the organization, job title, and start and end dates for each distinct role. These career histories allow us to track changes in board composition over time as well as flows into the board through new appointments. For top executives appointed during our sample period, we also collected information on their network connections with the organization's supervisory directors and top executives before the appointment. We measure connections between individuals using overlaps in their work history and education. Following Gormely et al. (2023), we define a connection as existing between two individuals if they ever worked simultaneously at the same employer or graduated from the same school within one year of each other.[17]

Our data on daily stock returns and accounting performance are from Bloomberg. The accounting variables are from a mix of quarterly, semiannual, and annual reports. For market benchmarks in our analysis of daily stock returns, we obtain the yield on 3-month U.S. Treasury securities from Federal Reserve Economic Data (DGS3MO), the S&P 500 value-weighted index

[16] We also obtain similar results if we use a German control sample that is restricted to more prominent companies included in a stock market index, such as the DAX, CDAX, MDAX, TecDAX, or Euro Stoxx 50, or when we compare targeted companies to public companies with multimember executive boards in Austria and Poland, two countries where the dual board structure is common.

[17] Our findings are similar if we use an alternative definition of connections, which also includes cases where the two individuals served at some point as an officer or director at the same club, organization, or nonprofits, even when this service did not overlap in time. Our findings are also robust to defining connections based on work history alone.

return from the Center for Research in Security Prices, and returns on FTSE Europe and MSCI World indexes from Bloomberg. We also analyze Tobin's Q, Winsorized at the 1% tails, to track longer-run changes in firm value and operating profits scaled to assets, both from Bloomberg.[18]

Summary statistics on the targeted and control firms are reported in Table 1, separately for 2019, the year before the quota was announced and passed, and 2023, the first full year after the quota went into effect and the last full year of our sample. As expected, targeted companies have larger boards and are also larger in terms of assets and market capitalization, particularly when compared to companies in Germany that were not subject to the quota. The Europe-wide comparison sample includes firms that are closer in size and profitability to the ones targeted by the quota. In keeping with their larger size, the targeted companies may have fewer growth opportunities, which are reflected in their lower Tobin's Q ratios.

In the year before the quota, 46% of targeted companies had a female top executive in place, more than did the comparison groups. However, accounting for their somewhat larger board sizes, targeted companies' average female share of EDs (9%) was not higher than that of the pan-European comparison sample. Targeted firms were also no more likely to have a female CEO. In 2023, after the quota's implementation, targeted firms had a much higher rate of having any female top executive (87%) and also a much higher average female share among top executives (21%).

III. Did the Quota Increase Gender Diversity at the Top?

III.A Female Representation Among Top Executives

We start by examining the law's impact on top executive teams' gender diversity, using two main outcomes: the share of the top executive team that is female and indicator for the

[18] Tobin's Q is computed by Bloomberg as (Market Cap + Total Liabilities + Preferred Equity + Minority Interest) / Total Assets. Results are unchanged if we use the full range of values without Winsorizing.

presence of any female top executive. We estimate a difference-in-differences comparison of changes in these outcomes between the period before and after the quota law is announced among targeted firms relative to others:

$$(1) \qquad Diversity_{jt} = \beta * Targeted_j * PostQuota_t + \alpha_j + \tau_t + \zeta_{jt},$$

where the outcome variable, $Diversity_{jt}$, measures female presence on the executive board of firm j in month t. We include firm fixed effects, α_j, to account for unobserved heterogeneity across companies and year-month fixed effects ,τ_t, to account for sample-wide variation over time. The standard errors are adjusted for clustering at the firm level to account for within-firm correlations over time.

We find large and statistically significant increases in female presence at targeted companies after the quota's announcement relative to each control group. The columns of Table 2 report estimates for the treatment effect, β, for the different outcomes and control groups. Compared to other German firms, the quota is associated with a 5.8 percentage point increase in the female share of top executives (column 1) and a 22 percentage-point increase in the likelihood of having at least one woman in such a role (column 2). This implies that the quota accounts for about half of the total increases between 2019 and 2023 in the female share of top executives (12 percentage points; Table 1) and in any female presence (41 percentage points; see Table 1) at targeted companies. The estimates are similar in magnitude when we examine the pan-European control group (columns 3 and 4).

The timing of the increase in female top executives is consistent with the quota law causing the increase. Figure 1 plots time-varying difference-in-differences estimates for the changes in the female share of top executives relative to 2019 for targeted versus other German firms in Panel A and for targeted versus other large European firms in Panel B. The corresponding estimates for

having any female top executive are reported in Panels C and D. The estimates come from expanding Equation (1) to split out the $\beta^{*}Targeted_j^{*}PostQuota_t$ term into ones that capture the differential effect on targeted firms in three periods: between the quota's announcement in November 2020 and its passage in August 2021 ($\beta_A^{*}Targeted_j^{*}Annoucenment_t$); between its passage and effective date in August 2022 ($\beta_P^{*}Targeted_j^{*}Passage_t$); and after the effective date ($\beta_E^{*}Targeted_j^{*}Effective_t$). To check for differential trends, the pre-quota period is also divided into calendar years by estimating the terms $\beta_y^{*}Targeted_j^{*}PostQuota_t^{*}1(Year=y)_t$, where $y = \{2016, 2017, 2018\}$. There is no estimate for 2019, the last full year before the quota, as it is omitted from the specification and provides the baseline for the other estimates, and the estimate for 2020 captures the portion of the year preceding the quota's announcement.

Figure 1 shows that the female share of top executives at targeted companies was relatively flat in the years before the quota and grew significantly after the quota's announcement. While there is some indication of growth in the early part of 2020 for the within-Germany comparison, this pattern is muted in the pan-European comparison is not statistically significant in either sample. After the quota's announcement, the female share grew over time and reached its highest level after the mandatory quota took effect. We find similar results across the different control groups.[19] This pattern is also shown in the regression estimates in Appendix Table A1. The initial increase in female shares (of about 3 percentage points) in the post-announcement period indicates that some firms took action in anticipation of the quota's passage and implementation. The continued increases to 5 percentage points in the period after passage, and then to 8 percentage

[19] As shown in Appendix Figure A1, we obtain similar results if we exclude firms in France from the pan-European controls. France followed Germany and, in December 2021, adopted a gender quota for senior executives that was legislated to take effect on March 1, 2026, followed by a two-year compliance period.

points after the law took effect, show that other firms only hired a female executive after being legally required to do so.

We reach similar conclusions from analysis using different reweighting approaches. Figure 2 reports estimates using synthetic controls (Abadie et al. 2010) in Panels A and B and using synthetic difference-in-differences (Arkhangelsky et al. 2021) in Panels C and D. These two estimation approaches differ primarily in that the synthetic control approach matches on both levels and trends in the pre-treatment period between the targeted and control firms, while the synthetic difference-in-differences approach matches only on trends. This distinction is more relevant for the within-Germany comparison (Panels A and C), where the control firms tend to be smaller in size and have lower diversity levels in the pre-period. Because targeted firms' pre-quota diversity levels were more similar to the pan-European controls (see Table 1), the two reweighting approaches yield relatively similar estimates (Panels B and D). In any case, all of the estimation approaches and control samples reveal a large and growing gap in female shares between targeted and other firms after the quota's adoption.

These reweighting approaches confirm the quota's sizeable impact on female representation among top executives. Table 3 reports the estimated effects (and standard errors) over the entire post-announcement period. Because the reweighting procedure is estimated only on firms that are present in all months of the sample, Table 3 reports OLS estimates on the balanced panels of German (column 1) and European (column 4) firms for comparison. These various balanced-panel estimates are slightly smaller than for the full sample, ranging across the samples and models from 4 to 6 percentage points for the increase in female top executive shares and from 15 to 28 percentage points for the increase in the share of companies with any female top executives. These results support the interpretation that the quota achieved its intended effect of

increasing gender diversity among top executives, over and above any secular trends in female leadership that affected other German or European firms.

III.B Female Representation Among Newly Appointed Top Executives

Next, we investigate effects of the firm-specific timing of the quota's sanction for violating the minimum participation mandate by examining individual new top executive appointments. The quota law does not mandate any specific timing for new appointments, and appointments occur with varying frequency at different sample firms. For this analysis, an observation is a new top executive appointment that occurs at a target or control firm during our sample period. For each appointment, we test whether the quota increased the likelihood of a woman being selected. Our estimation equation has a similar structure to equation (1) applied to a different unit of observation:

$$(2) \qquad Female_{ijt} = \beta * Targeted_j * PostQuota_t + \alpha_j + \tau_t + \zeta_{ijt,}$$

where the outcome, $Female_{ijt}$, is an indicator for a newly appointed top executive i at firm j in month t being female. As in equation (1), the model includes controls for firm and month fixed effects and the impact of the quota is measured by β, the coefficient on the interaction term for targeted companies after the quota's announcement. The standard errors are again adjusted for clustering at the firm level.

Results from this analysis are reported in columns 1 and 4 of Table 4. Across both estimation samples, we find that targeted companies' newly appointed top executives are more likely to be female after the quota is announced. The increase is 22.1 percentage points in the German sample (column 1) and 26.9 percentage points in the pan-European sample (column 4). Both estimates are highly statistically significant and represent a substantial increase relative to the sample means of 16 and 18 percent, respectively.

We also estimate an expanded version of the model to separately examine the effects of the quota on targeted firms' appointments when it is immediately binding versus when it is not. The quota explicitly bars only firms without a female top executive from appointing a male top executive, but the quota's shadow might also nudge firms to appoint additional female top executives to avoid being constrained later. To distinguish between the effects of the quota on targeted companies based on whether it is binding or not, we estimate the following equation:

$$(3) \quad Female_{ijt} = \beta^{NF} * Targeted_j * PostQuota_t * NoFemale_{jt} + \beta^{HF} * Targeted_j * PostQuota_t * HasFemale_{jt} + \gamma * NoFemale_{jt} + \delta * Targeted_j * NoFemale_{jt} + \chi * PostQuota_t * NoFemale_{jt} + \alpha_j + \tau_t + \zeta_{ijt},$$

where $HasFemale_{jt}$ is an indicator for a firm having a female top executive and $NoFemale_{jt}$ is an indicator for the opposite. In this model, the β^{NF} coefficient captures the effect of the quota when the firm does not have a female top executive, and the β^{HF} coefficient captures the effect when the company already has one or more female top executives in place before the new appointment. We also include a direct control for $NoFemale_{jt}$ as well as the pairwise interactions between that variable and the $Targeted_j$ and $PostQuota_t$ indictors.

We find that the quota's impact on targeted companies is largest when the firm has no female top executives in place.[20] In such scenarios, the quota increases the likelihood of a female appointment by 40 to 43 percentage points ($p < 0.001$; columns 2 and 5). This implies an incremental increase that is more than twice the size of the average female appointment rate in the sample (which is under 20%). The estimated impact of the quota is much smaller, and sometimes not statistically significant, when the company already has a female top executive. In all of the

[20] The quota does not require that all of top executive appointments by these firms are women, because when such firms appoint more than one top executive at the same time, only one of them must be female.

specifications, the difference between the treatments effects in these scenarios is statistically significant ($p < 0.01$).

Further analysis suggests the increase women's appointments after the quota cannot be explained by spillover effects from women on supervisory boards or pipeline effects from women in senior leadership positions below the top executive level. In a modified version of equation (3), reported in columns 3 and 6 of Table 4, we include additional controls for the female shares of the company's supervisory board and senior leadership. We find positive point estimates for both the spillover and the pipeline variables, although the only statistically significant estimate is for pipeline effects in the European sample. Conditioning on these controls has limited impact on the estimates, and we continue to find that a binding quota increases female appointments by about 40 percentage points ($p < 0.001$).

These results come from our sample of new top executive appointments for people not currently serving on the firms' executive board. However, companies also have the option of filling openings with existing members of the top executive team, through a change in job responsibilities (adding a new role and possibly dropping an old one). Because our data from Boardex include these role changes, we can also estimate our models using an extended sample that includes both new hires to the executive team and current members' appointments to new roles.[21]

Estimates from this expanded sample of appointments that includes both new and continuing top executives, also show that the quota causes sizable and significant increases in the likelihood of a woman being appointed, as shown in Appendix Table A2. The effect sizes are somewhat smaller on this sample, and the increased rate of female appointments is now concentrated entirely among targeted firms without female top executives already in place. For

[21] We do not observe extensions in the duration of an appointment or reappointments to the same position.

this sample, the quota increases the female share by about 30 percentage points ($p < 0.001$), more than 180% of the sample averages.

IV. How Did Firms Comply with the Quota?

In this section, we examine how targeted companies complied with the quota, including how they sourced top executives, what roles they filled, and the impact on the size of top executive teams. We first analyze the prior work experience and professional connections of newly appointed male and female top executives. Specifically, we study to what extent the new top executives came from internal promotions or from external searches, whether top executives sourced externally had prior connections to the firm's top leaders, and whether new top executives had previous experience in a top leadership position before their appointment. We then examine job titles to see into which roles female executives were hired to fill. Finally, we examine the size of the top executive team and changes in numbers of males and females to test whether the additional women were accommodated by replacing male members or by increasing the size of the leadership team.

IV.A. Recruiting Sources

We start by examining how the quota affects firms' sourcing of new top executives. We first extend our analysis of new top executive appointments to distinguish between internal promotions and external hires. We define a new top executive appointment as an internal promotion when the candidate transitions into the top executive position from a lower-ranking senior leadership position at the same company. Other appointments are designated external

hires.[22] In analysis reported Table 5, we subdivide female and male appointments into these different categories and re-estimate equation (3) after substituting indicator variables of these different outcomes for the dependent variable.

We find that companies targeted by the quota increase their appointments of both internal and external female candidates, replacing male candidates who would have been sourced through these channels in a similar proportion. As reported above in column 2 of Table 4, when a targeted firm without any female top executives appoints a new executive after the quota, the executive is 39.7 percentage points more likely to be female—and equivalently 39.7 percentage points less likely to be male—than when a nontargeted German firm without any female top executives appoints a new executive. The analysis reported in columns 1–4 of Table 5 decomposes these 39.7 appointments and 39.7 forgone appointments into internal promotions and external hires.

We find that more of the incremental female appointments are external hires (25.7 percentage points; column 2) than are internal promotions (13.9 percentage points; column 1). The larger increase in external hires is consistent with those appointments comprising the great majority of new top executives overall (75.6 percent in the German sample) and of female top executives in particular (74.6 percent in the German sample). We find similar patterns in the pan-European sample (see columns 6 and 7).

Although internal promotions to the management board are consequential outcomes for the promoted workers, entailing greater formal authority and responsibilities, they might be considered smaller adjustments than external hires. That firms predominantly satisfy the quota by hiring

[22] Because we only observe top executive and senior leadership roles, our external category can theoretically include promotions of even lower ranked managers or rank-and-file workers at the firm. However, we expect that promotions of these kinds, that effectively skip over hierarchical levels, are unlikely for top executive jobs at the major companies that constitute our sample.

women from outside of their ranks indicates that it induced changes in employment relationships and not just in the composition of upper management at affected companies.

The male appointments displaced by the quota had a similar split into internal promotions and external hires. Most of the men not appointed to top executive jobs because of the quota would have been external hires. Male external appointments are dropped by 24 to 27 percentage points (columns 4 and 9), while male internal promotions dropped by 16 to 17 percentage points (columns 3 and 8). On net, with firms sourcing the incremental women similarly to the men they replaced, the quota did not induce a significant overall change in the balance between inside and outside appointments (columns 5 and 10).

While external appointments tend to suffer from greater informational barriers than internal promotions, these barriers may be lower for candidates with connections to current top executives at the company.[23] We therefore conduct an additional analysis that subdivides external female and male hires based on whether the new executive had any professional network connections (through education or employment) to members of the top executive team prior to their appointment. Table 6 reports estimates of equation (3) after substituting indicator variables of these different outcomes for the dependent variable. We find that the quota led firms to hire female executives from outside their professional networks: targeted firms without any female top executives are 18.8 to 23.0 percentage points more likely to hire an unconnected female candidate than are similar untargeted firms (columns 2 and 7; $p < 0.05$ and $p < 0.01$, respectively). The point estimates for connected female candidates are also positive but they are smaller and not statistically significant (columns 1 and 5).

[23] Applicants referred by current employees are more likely to be hired (Pallais and Sands, 2016) and individuals with professional network connections to existing board members are more likely to be appointed to supervisory boards (von Essen and Smith 2023).

These results have both demand and supply interpretations. The quota likely induced firms to engage in additional search and recruiting efforts to identify and attract capable women they might have otherwise overlooked. It is also possible that the quota, by raising women's chances of ultimately being hired, increased women's willingness to engage in the competitive application process required to obtain a top executive position.

The estimates also indicate that the quota-induced decline in male appointments came firms passing over male candidates with whom they lacked connections. Targeted firms without any female top executives are 23.9 to 29.4 percentage points less likely to hire an unconnected male candidate than are similar untargeted firms (columns 4 and 9; $p < 0.05$ and $p < 0.01$, respectively), but they remain just as likely to hire a male candidate with whom they are connected (columns 3 and 8). Putting the various evidence together, it appears that firms were unwilling to pass over known (internal or connected) male candidates to comply with the quota, but they were willing to pass over men with whom they were less familiar. With firms passing over unconnected men to hire unconnected women, the quota's net effect on the overall rate at which companies hire from outside their professional networks is relatively small and not statistically significant (columns 5 and 10).

These results are robust to a variety of alternative definitions of insiders and outsiders and network connections, including focusing only on top executive connections based on prior employment (Appendix Table A3), focusing on connections between the new top executive and the current CEO (Appendix Table A4), or including connections to any member of the supervisory board (Appendix Table A5). The results are also robust to including all new top executive appointments and treating cases in which data are missing on particular connections, e.g., because

the prior work history of an existing top executive is incomplete or missing, as being unconnected (Appendix Table A6).

IV.B. Prior Leadership Experience

We next examine the effect of the quota on the quality of new top executives. We proxy for quality using measures of human capital based on the executive's prior experience in a top corporate job (Becker 1962). We then re-estimate equation (3) on the sample of new top executive appointments, analyzing indicator variables for the new hire possessing or lacking prior top executive experience, interacted with gender indicators, as the dependent variables.

The results are reported in Table 7 for our primary measure of experience, which focuses on whether the individual has previously held a comparable position as a top executive at a public company. We find that the quota primarily increased appointments of women who lacked this experience, with estimated increases of 0.36 and 0.39 in the German and pan-European samples (columns 2 and 7). The estimated increases in experienced women (in columns 1 and 6) are an order or magnitude smaller. This shift toward less experienced women was matched by a similar-sized shift away from less experienced men (columns 4 and 9), leading to only modest estimates for the combined impact of the quota on the overall share of appointments with prior top executive experience. The point estimates imply that the overall share with this experience decreases by less than 1 percentage point in the German sample and by 4 percentage points in the pan-European sample, and neither estimate is statistically different from zero.

These results show that most of the change induced by the quota was among appointments of individuals to serve for their first time as a top executive of a public company. This pattern is consistent with these appointments representing over 80% of new appointments in our sample, as

companies regularly draw from the less experienced pool of candidates in making top executive appointments. The lack of a significant increase in female appointees with prior top executive experience implies that targeted firms largely did not poach top female top executives from other public companies, including those in our control samples, to comply with the quota.

Because prior top executive experience is relatively uncommon in our sample of new appointments, we also repeat our analysis using broader measures of previous leadership experience and again find no significant impact of the quota on the average experience level of new top executives. The point estimates continue to find modest, statistically insignificant, declines in experience levels when we expand our experience measure to include top executive roles at private companies (Appendix Table A7) and also positions on supervisory boards (Appendix Table A8).

Our analysis of these broader measures of prior experience shows that the quota increased appointments of women with significant prior corporate leadership experience as executives at private companies and as supervisory board members. Women hired because of the quota appear to be drawn at similar rates between those with and without any public or private top executive experience, with somewhat larger declines in the hiring of experienced rather than inexperienced men (Appendix Table A7). When we further broaden the experience measure to also include supervisory board positions, the effects of the quota are concentrated primarily among more experienced male and female hires (Appendix Table A8).

Taken together, these experience results show that companies were able to comply with the quota by appointing women with prior leadership experience as top executives at private companies or as supervisory board members yet had not previously served as a public company

top executive. Hiring these women, however, did not affect the average experience level of new top executives, because the males not hired had a similar experience profile.

IV.C. Top Executive Roles Filled and Team Size

We continue our examination of how firms complied with the quota by exploring what functional roles the new female top executives filled. We do this in two ways. First, we estimate board-level effects using Equation (1) with different dependent variables that indicate whether or not the firm has a female top executive whose job title includes a given functional area. These variables measure whether a firm has any female executive serving in that role, irrespective of whether the executive also covers other areas or whether other executives cover the same functional area.[24] Second, we focus on flows into roles and estimate Equation (3) on the sample of new appointments, with dependent variables that indicate whether or not that particular appointment is of a women to a given job function.

We analyze the job functions that appear most frequently in targeted companies in our sample, specifically all roles used by at least one-fifth of targeted firms in 2019, the year before the quota. As show in Appendix Table A9, these are: Chief Executive Officer (CEO, in 100% of firms); Chief Financial Officer (CFO, 94%), Head of Human Resources, Labor, People, or Talent (HR, 55%), Chief Operating Officer (COO, 36%), Division CEO (28%), Sales (22%), and Technology (21%). These categories are not exhaustive and 42% of targeted companies had at least one executive with a less common role, which we label as "Other".[25] We classify

[24] When a job title includes multiple functional roles (such as, "CEO, CFO, and Head of HR"), we set the indicators to one for all relevant roles. Thus, with the exception of the "unknown" role category, roles are not mutually exclusive. This definition also means that the measure of any female top executive presence within a role category does not decrease when a single women goes from holding one role exclusively to splitting her time between multiple roles.
[25] The most frequent other role types are deputy CEO (13%), divisional leadership other than CEO (10%), marketing (9%), IT (9%), legal (9%), and risk (6%).

uninformative titles (e.g., "Executive Director") together as having an "Unknown" role. Unclassifiable positions are observed at 54% of targeted companies in 2019. Appendix Table A9 also reports the unconditional share of firms with a female top executive in the role as well as this same share after limiting the sample to firms with any top executive in the role. The most common role for female top executives in 2019 is HR (24% of firms). The role with the highest female presence (67%) is the relatively rare position of legal chief (present at fewer than 10% of firms), while HR is the second most female (43%).

Figure 3 summarizes results from regressions examining indicators for women holding each of these executive roles. Panel A analyzes the panel of firm-month observations and reports the β estimates from Equation (1), while Panel B analyzes the sample of new top executive appointments and reports the β^{NF} estimates from Equation (3). The parameter estimates are shown using diamond markers for the German sample, circles for the pan-European sample, and bars depicting 95% confidence intervals around each point estimate.

We find that the quota did not increase the female share of CEOs. The point estimate is small, negative and statistically insignificant. The lack of any impact on what is typically the most consequential position within the firm[26] is perhaps unsurprising, given that the quota did not place requirements on specific positions within the top executive team. Furthermore, we do not detect significant increases in women's presence in the other major C-suite roles of CFO or COO, or in the number of firms with women in Division CEO, Sales or Technology roles. The insignificant impact of the quota on the ranks of female CFOs, COOs, and Division CEOs suggests that the quota's potential long-term effects on female CEOs may take significant time to be realized

[26] Longstanding research confirms the importance of individual CEOs for firm performance (e.g., Bertrand and Schoar 2003; Bandiera et al. 2020).

without further intervention, as these are the key stepping-stone roles for that position (Heidrick & Struggles 2023).

We find that, rather than filling those stepping-stone roles, the new female top executives tend to fill HR or one of the less common roles. The largest increase is the 20 percentage point boost in the share of firms with a female top executive in HR (Panel A of Figure 3). This increase is substantial and of a similar magnitude to the share of targeted firms with women in HR roles in the year before the quota (24%). The magnitude is also similar to the estimate reported in Panel B of Figure 3, indicating that much of women's increased presence in HR is from women being newly hired by firms in HR roles, rather than from their shifting to HR from another top executive role or from their being less likely to exit from HR roles. We estimate that female top executives serving in less common roles also increase, by about 10 percentage points.[27]

Thus the quota led firms to appoint women to fill a functional role, HR, for which the female share of top executives was relatively high before the quota. In 2019, the female share in HR was 43 percent. Only legal roles have a greater share of women, and those roles are relatively uncommon (held by a top executive at only 9 percent of firms). Other less common roles had lower female presence in 2019 and saw substantial increases over the sample period. For example, while of the top executives in lower divisional roles (e.g., Division COO) were women in 2019, 50 percent of these positions were held by women in 2023. We conclude that targeted firms minimized their costs of complying with the quota by hiring women into functional areas that have larger female talent pools, such as HR, or that are less common among top executives.

[27] When we attempt to decompose this increase into specific roles, the gains for female executives are mainly among lower divisional roles (e.g., Division COO) and roles related to sustainability; however, these individual estimates (2 to 3 percentage points each in the firm-level analysis and 5 to 6 percentage points in the new appointment analysis) are generally not statistically significant.

Firms' reliance on more traditionally female, and arguably less powerful, top executive positions could suggest that the newly appointed women were relegated to a token status and not influential within the company's management, despite being on the top executive team. While joining a company's top executive team gives a manager an important seat at the table, firms that wanted to comply with the quota in a perfunctory manner could have added women to these teams without otherwise changing team's composition.

We investigate this possibility by asking how firms adjust the structure of their top executive team after the quota. The quota prevents targeted firms without any female top executives from filling vacancies with men. Firms can comply either by expanding the size of their top executive team to incorporate a woman or by hiring a woman instead of a man to fill an existing position. Both methods of adjustment would increase the female share of appointments and decrease the male share, but only the latter reduces the number of top executive jobs held by men. Under the latter, the new female top executive is also less likely to have only a token role on the executive team.

To distinguish between these two means of adjustment, we re-estimate Equation (1) using as dependent variables the numbers of top executives—male, female, and total. The results, reported in Table 8, suggest that most targeted firms used the second method of adjustment. We find that targeted firms increased their number female top executives relative to control firms (columns 3–4; $p < 0.001$) and reduced their number of male top executives (columns 5–6; $p < 0.05$). The reduction in male executive positions reflects a cost to some members of the more prevalent group from the imposition of a quota requiring minimum participation from both genders. The relative magnitudes of these two estimates imply that 63 to 75 percent of the new female top executives hired after the quota replaced men. Consistent with this finding, we estimate

that the quota had only a minimal, statistically insignificant impact on board size, relative to the sample mean (columns 1–2).

V. How Did the Quota Affect Firm Performance?

Finally, we examine how the quota affected firm value and performance. We start by measuring the impact of the quota's announcement on targeted companies' stock market valuation, which in theory represents the financial market's estimate for the present discounted value of the company's future cash flows. Under finance theory, capital markets incorporate all available information about a firm's prospects into its stock price. Following this premise, one can study how a particular event changes a firm's prospects by quantifying the impact of the event on the firm's stock. Finance scholars have developed the event study methodology to perform this type of analysis on stock returns. We use this method to examine how the gender quota's announcement targeted companies' stock returns. Although this approach is commonly applied to measuring the value effects of gender quotas for supervisory boards (e.g., Allen and Wahid 2024, Eckbo et al. 2022, Ahern and Dittmar 2012), it should be noted that its reliance on investors' expectations makes it susceptible to systematic biases, if any, that investors may harbor against female top executives (Wolfers 2006), which could lead to excessively negative initial reactions to news of a quota.

On key dates related to the quota's announcement and formulation, we compare the excess stock returns of companies targeted by the quota to those of the comparison companies in Germany and elsewhere in Europe. To mitigate issues related to the cross-correlation of stock returns (see Eckbo et al. 2022), we conduct the analysis on portfolios of targeted and comparison firms, rather than on data for the individual firms themselves. In our analysis, we focus on three event dates:

1. October 28, 2020. Publication of the German federal government's report showing that its requirement for firms to set nonbinding targets for female executive representation had limited impact. The report recommended that the government adopt a mandatory gender quota for top executives. Although it called for a hard quota, the report did not specify how high the quota should be.
2. November 22, 2020. Announcement of Germany's coalition government's plan to introduce a mandatory quota for the number of women working as top executives in parity-codetermined companies with four or more members on their management board. The plan was hailed as a "historic" step towards sexual equality in German boardrooms (Goodley 2020).
3. January 6, 2021. Introduction of the draft law establishing the quota. The text contained all of the details for when the top executive quota would be applied and how it would be enforced.

For each portfolio, we calculate the average daily excess stock return over the yield on 3-month U.S. Treasury securities, weighted using firms' previous day market capitalization, for each day from a calendar year before the first event through five trading days after the last event.

We regress the excess total return including dividends r_{pd} of portfolio p on date d on an indicator for being a firm targeted by the quota interacted with indicators for the dates of the event window, D_s^e, where e corresponds to the number of the event listed above and s indexes the trading day relative to the event. For example, $s = -1$ is the trading day before the event date. Our baseline specification examines a three-day event window, starting on the trading day before each event:

$$(4) \qquad r_{pd} = \sum_{e=1}^{3} \sum_{s=-1}^{1} \propto_s^e Targeted_p \times (D_s^e)_d + \sum_{e=1}^{3} \sum_{s=-1}^{1} \gamma_s^e (D_s^e)_d + \delta_1 Targeted_p + \delta_0 + \psi_{pd}$$

We then compute the cumulative abnormal excess return as the sum of $\propto_s^e$ for each event. Table 9 reports these sums and their standard errors, computed using the delta method. Panel A examines the returns of quota-targeted firms compared to other German companies, and Panel B compares them to the large companies across Europe.[28]

We find that the publication of the government report laying the groundwork for the quota (Event 1) is associated with negative stock returns. Estimates of equation 4 are reported in column (1) of Table 9. Relative to other German companies, the value of companies that would be targeted by the eventual quota dropped by about 4 percentage points on the three days around the quota's adoption ($p < 0.001$). When targeted firms are compared to other large European companies, the estimate is slightly smaller but still highly statistically significant. However, the second and third events display a different pattern. The announcement that there would be a mandatory quota (Event 2) and the introduction of the draft law itself (Event 3) are associated with positive abnormal returns in the baseline specification. Event 2 increased stock values by about 2.3–2.5 percentage points ($p < 0.001$) and Event 3 increased stock values by about 1.0–1.7 percentage points ($p < 0.05$).

We examine the robustness of these results in various ways. In a first set of robustness analyses, we more flexibly control for the possibility that other unrelated events confound the estimates. Whereas the baseline estimates use only the control firms as a counterfactual, in further tests we allow for the targeted-firm and untargeted-firm portfolios to have different sensitivities to the market return. In analysis reported in column (2), we add in controls for the daily excess return

[28] In the pan-Europe analysis, we exclude significant trading holidays, including holidays that are not observed in Germany. Specifically, we drop any dates where the number of comparison firms is 10% lower than on the previous day, and then for all firms calculate the stock return relative to the previous day retained in the sample.

on the FTSE Europe Index, which is a market-capitalization weighted index composed of large and mid-cap European stocks. We also control for the interaction of *Targeted* and the index return to allow for the portfolios to have different market sensitivities. Column (3) reports results that also include controls for one- and two-trading day lags of the FTSE Europe Index return and the interaction of these returns with *Targeted*. The results are similar if we control for other stock market indexes instead. Column (4) reports results using the S&P 500 Index, the benchmark index for large U.S. corporations; and column (5) reports results using the MSCI World Index, which captures large and mid-cap companies across 23 developed markets countries in Asia, Europe, North America, and Oceania. In a second set of robustness analyses, we vary the size of the event window. Column (6) reports results for a one-day window, column (7) reports results for a five-day window from two days before to two days after, and column (8) an 11-day window from five days before to five days after. The negative reaction to Event 1 is robust throughout all the robustness analyses, but the positive reactions to Events 2 and 3 are less so.

The most straightforward interpretation of the market's negative reaction to the publication of the government's report on October 28, 2020, is that the report was the first indication that Germany might adopt an unprecedented gender quota on corporate executives. The second event is more complicated because the announcement of a deal between coalition partners (Angela Merkel's Christian Democratic Union and the Social Democratic Party) increased the perceived probability that a quota would be imposed while also providing the first concrete details about the form it would take.

Before any details of the proposal were announced, initial expectations likely anchored on Germany's earlier quota for supervisory boards, which set a threshold of 30% and applied to all companies subject to parity codetermination. The announcement of the proposed top executive

quota revealed that it would set a lower hurdle, requiring only a single woman, and target a more limited set of companies, applying only to firms with management boards of four or more members. Given these features, part of the market's apparent favorable reaction to the plan's announcement (Event 2) could reflect investors realizing that the quota that would be enacted by the coalition government would be more flexible and less burdensome than they had anticipated.

Although the quota's announcement specified these high-level features, the introduction of the draft text a month and a half later clarified details about how the quota would be applied and implemented. For example, the draft text revealed that the quota would only apply at the time of new top executive appointments. Because the quota's enforcement mechanism was limited to restricting new top executive appointments, the quota would never force a company to add or remove top executives. This design gives companies greater control over the timing of their female top executive integration, and it allows them to avoid sanctions even if they take time to respond to a sudden departure of their only female top executive. While the positive stock price response to the draft text's introduction (Event 3) in columns 1 to 6 of Panel B in Table 9 could reflect the market reacting favorably to this new information, this finding is less robust, as the Event 3 estimate in columns 7 and 8 in Panel B, and the majority of models in Panel A, are statistically insignificant.

The pattern of estimates across the three events suggests that some of the initial value reduction that immediately followed the government report recommending a top-executive gender mandate diminished as details of the quota were developed and formalized through the legislative process. To the extent that this pattern indicates that markets overreacted to the initial news event and formed excessively negative expectations about its eventual form and impact, it would suggest

that more time and experience with the quota law, as passed, might further mediate the initial reaction.

To estimate the overall effects of the quota on firm value over a longer-horizon, including effects induced by market participants learning about the quota and its impact in gradual ways not traceable to specific discrete announcements, we return to our difference-in-differences estimation framework from Section 3. We estimate a version of Equation (1) that allows us to compare changes in market values between targeted and control firms through the end of 2023:

$$(5) \qquad Q_{jq} = \beta_1 \, Targeted_j \times PostReport_t + \beta_2 \, Targeted_j \times PostPassage_t + \alpha_j + \tau_t + \zeta_{jt,} \, ,$$

where *PostReport* is an indicator for periods after Event 1 on October 28, 2020, and *PostPassage* is an indicator for periods after the quota was passed into law in August 2021. The unit of analysis is a company, j, in a reporting quarter, q, defined by the ending month of the reporting period. The specification includes both firm fixed effects α_j and quarter fixed effect τ_t. Our main variables of interest are β_1 and β_2, which capture the relative changes in market value scaled by assets (Tobin's Q) between targeted and comparison companies in each of the post periods relative to the pre-quota period. The first post period, which we call the Post Report period, starts after the public release of the government report calling for a quota and, because of the close proximity of the first two events, also includes the period following the announcement of an agreement to create a quota. The second post period, which we call the Post Passage period, starts after the quota law was enacted and includes observations both before and after the mandate took effect.

The estimated effects of the quota in each post period are shown in Table 10 for each of four samples. Columns 1 and 2 use the German control firms, while columns 3 and 4 use the pan-European sample. Columns 1 and 3 include data from all financial reports, regardless of their periodicity, while columns 2 and 4 are limited to quarterly reports. The point estimates for the

initial announcement period are consistently negative, echoing the negative market response to Event 1 in our event study analysis (reported in Table 9), but they vary in their degree of precision and are statistically insignificant in the European samples. By contrast, the relative change in value in the subsequent quota period, following the passage of the law, is consistently positive in sign and statistically significant.[29] Taken together, the estimates in Tables 8 and 9 indicate that while firms suffered an initial decline in value related to the prospect of a gender quota for top executives, they recovered to a significant degree. Indeed, the total impact on value in the post-adoption period, relative to the pre-report period (measured by the sum of the two estimates), is small and statistically indistinguishable from zero at conventional levels in all of the samples.

Finally, we use the same framework to examine the impact of the quota on firms' profitability. Whereas stock value reflects the market's anticipated future profits over the long-term, operating profits (scaled to assets) measures firms' realized near-term performance. The results are reported in Table 11, whose layout follows the same structure as Table 10. In analysis that combines data from financial statements with different periodicities (reported in columns 1 and 3), we adjust operating profits from annual or semi-annual reports to quarterly equivalents by dividing by 4 or 2, respectively.

While the estimates are imprecise, we find no detectable effect of the quota on the short-term profitability of targeted firms. The estimated effects of the quota on profits vary in sign across the sample and are never statistically significant from zero. The effect is not statistically significant in either treatment period, relative to the pre-treatment period or to one another, and is also not statistically significant in any of the samples or augmented models, reported in Appendix Table A11, that control for sector-specific trends and firm size.

[29] As shown in Appendix Table A10, we obtain a similar pattern of results when we account for sector-specific time trends and control for firm size (using the natural logarithm of assets).

The absence of a short-run operating profit impact of the German quota for top executives contrasts with supervisory board quotas' significant negative effects on profitability in Norway, France, and Spain (Matsa and Miller 2013, Comi et al. 2020, and Eckbo et al. 2022). The difference may stem from the varying natures of the quotas or the settings in which they were adopted. It is also possible that the nature of the changes induced by the additional female top executives will affect profits over the medium or long-term, while those from supervisory boards have more immediate consequences.

VI. Conclusion

Women have long been underrepresented in corporate leadership, and increases have been slow. Policymakers unsatisfied with the slow pace of change have recently employed a novel tool to force corporations to add women to their executive ranks: gender quotas for managers. We study the first of these, which was first announced in November 2020 and targets top executives in Germany. Since then, France imposed gender quotas on managerial positions in corporations with 1,000 or more employees, requiring of 30% female representation by 2026 and 40% by 2029.

We estimate that, within three years of its announcement, the German quota increased the female share of corporate executives at targeted firms by two-thirds with the largest increases at firms where the quota was immediately binding. The targeted firms primarily recruited new female executives from outside of the company and its leaders' professional networks, selecting these women in place of outside males with whom they also lacked connections. Before the quota, firms overwhelmingly opted for men when hiring executives from outside of their leaders' professional networks. But when facing the quota, targeted firms passed over some of these unconnected male candidates in favor of similarly unconnected women.

Despite these changes in firms' executive teams, we find no evidence that the quota meaningfully changed targeted firms' performance. Financial statements to date show no sign of the quota significantly affecting corporate profits. Although targeted companies' stock market valuations fell in reaction to early signs of the quota's conceptualization, it recovered as details of the quota were formulated and adopted. The lack of a long-run valuation effect could be related to how firms complied: the quota forced firms to meaningfully diversify their top executive teams, but it did not lead them to change the gender of the CEO. The female shares of CEOs, CFOs, COOs, and divisional leaders did not detectably increase. Rather, targeted firms largely recruited new female executives into more specialized roles, many of which already had greater female representation before the quota, most prominently into human resources and labor relations.

The mandatory gender quota was not the German government's first attempt to get top companies to hire female executives. In 2015, Germany required top companies to set a target figure for female executives. These companies were required to report annually whether they had met their target or explain why not (so called "comply or explain"). To create systems conducive to advancing women into executive roles, these companies were even required to have at least 30% women on their supervisory boards. But these policies did not achieve policymaker's stated objectives: only 7.7% of top executives were women, the vast majority of companies (80.7%) had no female top executives at all, and 78.2% of companies set a target figure of zero or no target figure at all (BMFSFJ 2020). We find that the mandatory quota for top executives, in contrast, was effective. This pattern of findings is consistent with the limited effects of diversity goals in the federal contractor program (Leonard 1989) and policies aimed at diversifying candidate pools (akin to the "Rooney Rule" used in the NFL; Fershtman and Pavan 2021). Our findings show that

hard quotas, focused on hiring outcomes, are more effective than "softer" affirmative action policies.

While our results show that gender quotas can expand diversity in corporate leadership, apparently without hurting firm performance, they also show that firms mainly complied by meeting minimal standards and by appointing women to potentially less powerful roles among top executive positions. This raises the question of whether the quota was itself consequential or if it had only symbolic effects. While being promoted to the top executive team under the formal dual-board structure is itself a meaningful change in access and responsibilities, an important question for future research is whether these promotions also helped female top executives develop their skills and networks to obtain further promotions, including to CEO positions, at their current firms or elsewhere. Another important consideration is that symbolic gains for female leaders can themselves be significant, particularly if those leaders invest in supporting and mentoring other women in business or if their accomplishments inspire greater ambition among women in later cohorts (see, e.g., Beaman et al. 2012).

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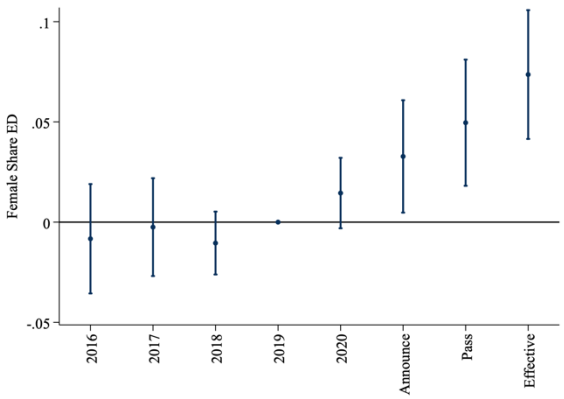
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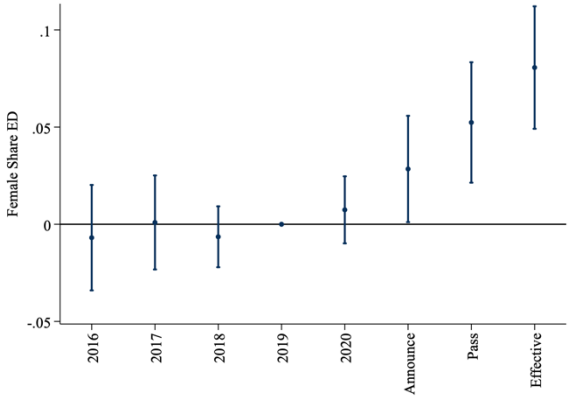
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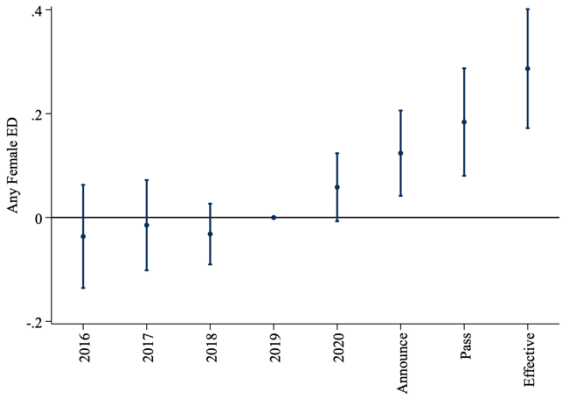
Figure 1: Timing of Changes in Female Representation Among Top Executives Before and After the Quota's Adoption



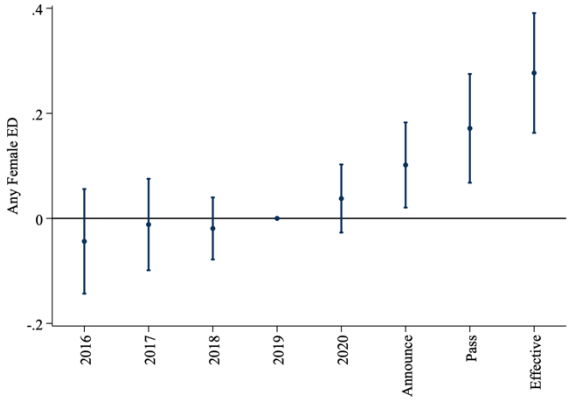
Panel A: German Firms



Panel B: European Firms



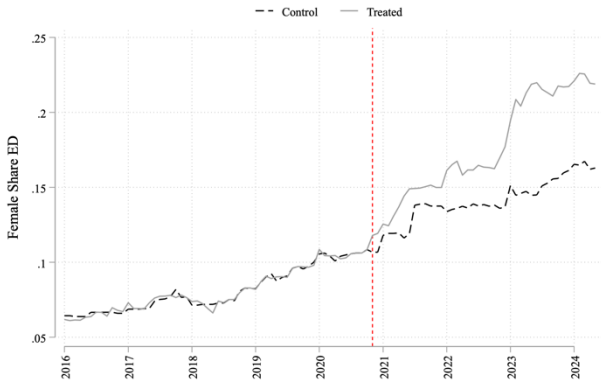
Panel C: German Firms



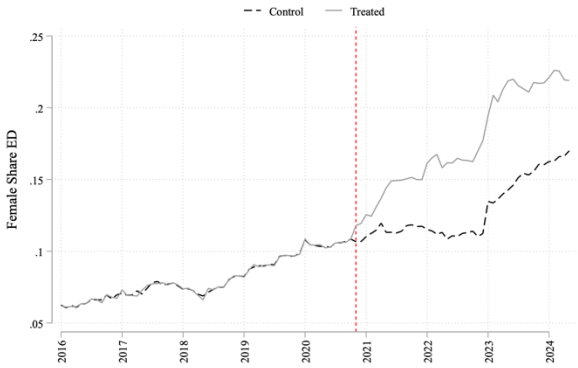
Panel D: European Firms

Notes: The figures plot difference-in-differences estimates and 95% confidence intervals for relative changes in the average share of female top executives in the years before and time periods after the three key quota events (being announced, passed, and taking effect), in Panels A and B, and in the share of companies with any female top executive, in Panels C and D. The models include firm and year fixed effects and use robust standard errors clustered at the firm level. Panels A and C use other German firms as controls, while Panels B and D use large public companies with dual boards across Europe. An observation is a company-month between January 2016 and May 2024.

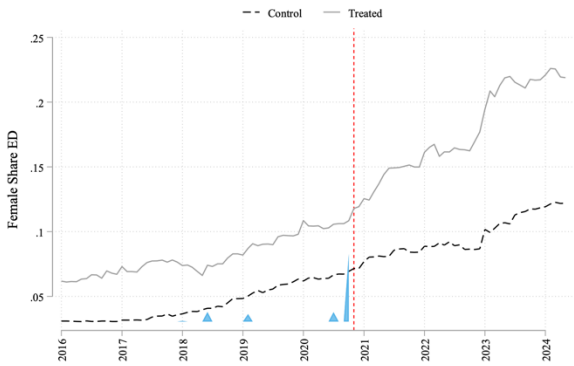
Figure 2: Reweighted Difference-in-Difference Estimates



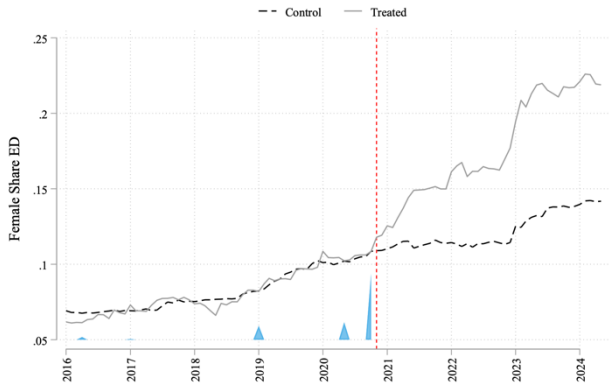
Panel A: Synthetic Controls, German firms



Panel B: Synthetic Controls, European firms



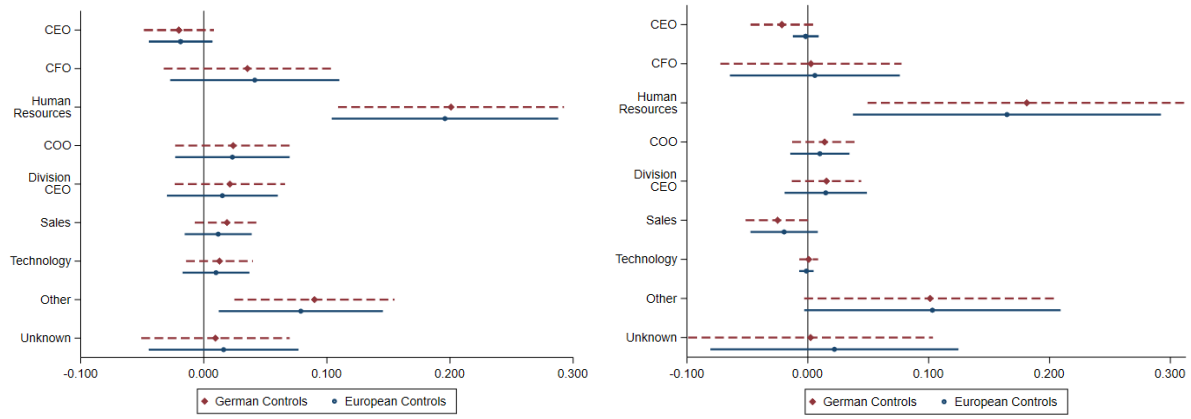
Panel C: Synthetic DID, German firms



Panel D: Synthetic DID, European firms

Notes: The figures depict trends in the average female share of top executives on the balanced panel of firms that are present in every month of the sample period from January 2016 and May 2024. The solid grey lines show raw data for targeted firms and the dashed black lines show the weighted averages among control firms, where the weights are computed using pre-quota data. Panels A and C use weights from synthetic controls (Abadie et al. 2010) that match the levels and trends in the pre-period, while Panels B and D use synthetic differences-in-differences (Arkhangelsky et al. 2021), which only matches on trends. The panels on the left use other German firms as controls, while those on the right use large public companies with dual boards across Europe.

Figure 3: Effects of the Quota on Female Top Executive Presence by Role



Panel A: Firm-Month Observations

Panel B: New Appoinments

Notes: This figure shows the effects of the quota on female top executive presence in different functional roles. In Panel A, an observation is a company-month between January 2016 and May 2024, while in Panel B, it is a new top executive appointment during that period. Separate regression models are estimated for each outcome variable and for the German (red diamonds) and pan-European (blue circles) samples. The outcomes are indicators for the company having any female top executive with a job title relating to the function listed on the left. The figure plots the coefficient estimates, and 95 percent confidence intervals, for the estimated treatment effect. In Panel A, this is the coefficient on the interaction term between the affected firm indictor and the indicator for the observation coming after the quota's announcement in October 2020. In Panel B, it is the interaction between the affected and post indicators and the indicator for the firm having no other female top executive in place. All models include firm and year fixed effects. Robust standard errors are clustered at the firm level.

Table 1. Summary statistics

	2019			2023		
Sample:	Targeted	Control Germany	Control Europe	Targeted	Control Germany	Control Europe
Mean:						
Female Share of Top Executives	0.09	0.05	0.09	0.21	0.10	0.14
Any Female Top Executives	0.46	0.16	0.28	0.87	0.26	0.41
Female CEO	0.03	0.04	0.05	0.03	0.06	0.07
Total Number of Top Executives	5.50	2.91	3.59	5.56	2.88	3.69
Quarterly Operating Profits/Assets	10.49	2.96	11.79	13.11	2.09	12.25
Tobin's Q	1.41	2.00	1.89	1.29	1.67	1.71
Ln(Assets)	9.79	5.92	7.51	9.91	6.21	7.70
Ln(Market Value)	10.03	6.39	7.94	10.10	6.56	8.06
Total:						
Firms	67	430	546	71	415	484

Notes: Summary statistics are presented for 2019 (the year before the quota's annoucement) and 2023 (the last full year of the data) on three samples of companies: affected companies in Germany (parity codetermined and at having least 4 top executives on their management board) and two sets of control firms (unaffected in Germany and unaffected larger companies across Europe). All firms in the sample are publicly traded and operate under a a dual-board structure with a multimember management board. Variables are first averaged to the firm-year level (diversity measures are from monthly snapshots and financial reports can be quarterly, semi-annual or annual) and then averaged across firms within each year. The underlying variable for Number of Top Executives is a count; Any Female Top Executive and Female CEO are indicators; the remaining variables are continous.

Table 2. Effects of the Quota on Female Representation Among Top Executives

	Female Share of Top Executives (1)	Any Female Top Executives (2)	Female Share of Top Executives (3)	Any Female Top Executives (4)
Targeted * Post	0.0584***	0.223***	0.0610***	0.212***
	(0.0136)	(0.0447)	(0.0133)	(0.0445)
Observations	46,841	46,841	58,323	58,323
Firms	624	624	747	747
R^2	0.0979	0.108	0.0785	0.0883
Dep. Var. Mean	0.0734	0.24	0.103	0.343
Fixed Effects				
Month	X	X	X	X
Firm	X	X	X	X
Control group	Germany	Germany	Europe	Europe

Notes: Unit of observation is a company-month computed on the first day of the month. The Post period starts after the initial annoucement of the quota in November 2020. Affected companies are public companies in Germany subject to parity co-determination with at least four top executives. The Germany control group includes other public German companies with at least two top executives (EDs). The European control group includes large public companies across Europe with dual board structures and at least two EDs. Robust standard errors clustered at the firm level.
+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3. Estimated Effects of the Quota on Female Representation with Alternative Specifications

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Female Share of Top Executives						
Targeted * Post	0.0494***	0.0361*	0.0421***	0.0608***	0.0477***	0.0546***
	(0.0147)	(0.0143)	(0.0106)	(0.0138)	(0.0139)	(0.0113)
Model	Fixed Effects	SC	SDID	Fixed Effects	SC	SDID
Control group	Germany	Germany	Germany	Europe	Europe	Europe
Observations	29,391	29,391	29,391	40,299	40,299	40,299
Panel B: Any Female Top Executive						
Targeted * Post	0.189***	0.283***	0.152***	0.190***	0.166**	0.161***
	(0.048)	(0.060)	(0.039)	(0.0465)	(0.0511)	(0.0435)
Model	Fixed Effects	SC	SDID	Fixed Effects	SC	SDID
Control group	Germany	Germany	Germany	Europe	Europe	Europe
Observations	29,391	29,391	29,391	40,299	40,299	40,299

Notes: Columns 1 and 4 report treatment effects from OLS models with company and month fixed effects (as in Table 2), estimated on a balanced panel sample of observations from firms with data available in every month in the sample period. Columns 2 and 5 report synthetic controls (SC) estimates (Abadie et al. 2010), and Columns 3 and 6 report synthetic difference-in-differences (SDID; Arkhangelsky et al. 2021) estimates.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. Effects of the Quota on the Gender of New Top Executive Appointments

	Woman Appointed					
	(1)	(2)	(3)	(4)	(5)	(6)
Targeted * Post	0.221***			0.269***		
	(0.0612)			(0.0523)		
No Female * Targeted * Post		0.397***	0.395***		0.435***	0.429***
		(0.0785)	(0.0783)		(0.0750)	(0.0748)
Has Female * Targeted * Post		0.0277	0.0409		0.165**	0.167**
		(0.0766)	(0.0783)		(0.0623)	(0.0612)
No Female	0.206***	0.291***	0.279***	0.161***	0.181***	0.185***
	(0.0531)	(0.0567)	(0.0572)	(0.0313)	(0.0323)	(0.0326)
No Female * Targeted	0.189**	-0.00900	0.00625	0.207**	0.0861	0.0817
	(0.0724)	(0.0853)	(0.0868)	(0.0632)	(0.0738)	(0.0735)
No Female * Post	0.171**	0.0337	0.0462	0.180***	0.133**	0.131**
	(0.0523)	(0.0635)	(0.0653)	(0.0372)	(0.0415)	(0.0422)
Female Share Senior Leadership			0.131			0.145*
			(0.0825)			(0.0680)
Female Share Supervisory			0.227			0.165
			(0.147)			(0.119)
Pr(Equal Effects)		< 0.001	< 0.001		0.002	0.004
Observations	1,629	1,629	1,493	2,603	2,603	2,550
Firms	446	446	396	587	587	579
Dep. Var. Mean	0.162	0.162	0.167	0.178	0.178	0.177
Fixed Effects						
Month	X	X	X	X	X	X
Firm	X	X	X	X	X	X
Control Group	Germany	Germany	Germany	Europe	Europe	Europe

Notes: The unit of observation is an appointment of a new top executive (i.e., executive director). The outcome variable is an indictor for the new top executive being female. The Post period starts after the initial annoucement of the quota in November 2020. The indicators No Female and Has Female are defined by whether the company has a female top executive at the start of the month prior to the focal appointment's start date. The variables for female share of senior leaders below the top executive (ED) level and for the female share of non-executive supervisory board members are calculated in the prior month. Robust standard errors clustered at the firm level.
+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 5. Effects of the Quota on New Top Executive Appointments by Source Inside or Outside the Firm

	Female		Male		Any	Female		Male		Any
	Inside	Outside	Inside	Outside	Inside	Inside	Outside	Inside	Outside	Inside
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
No Female * Targeted * Post	0.139*	0.257***	-0.160*	-0.237*	-0.0204	0.148*	0.291***	-0.168*	-0.272**	-0.0197
	(0.0640)	(0.0768)	(0.0761)	(0.0951)	(0.0881)	(0.0651)	(0.0743)	(0.0718)	(0.0910)	(0.0869)
Has Female * Targeted * Post	0.0613	-0.0336	-0.0127	-0.015	0.0486	0.0169	0.131*	-0.0251	-0.123	-0.00820
	(0.0458)	(0.0689)	(0.0881)	(0.0960)	(0.0879)	(0.0362)	(0.0553)	(0.0672)	(0.0841)	(0.0746)
Observations	1,629	1,629	1,629	1,629	1,629	2,625	2,625	2,625	2,625	2,625
Firms	446	446	446	446	446	588	588	588	588	588
R^2	0.128	0.2	0.11	0.158	0.116	0.0807	0.102	0.0533	0.0822	0.0528
Dep. Var. Mean	0.0411	0.121	0.203	0.635	0.244	0.0469	0.132	0.230	0.591	0.277
Fixed Effects										
Month	X	X	X	X	X	X	X	X	X	X
Firm	X	X	X	X	X	X	X	X	X	X
Control group	Germany	Germany	Germany	Germany	Germany	Europe	Europe	Europe	Europe	Europe

Notes: The unit of observation is an appointment of a new top executive (i.e., executive director). The outcome variables are indictors for the new top executive being a female insider, who is promoted internally from a senior leadership position within the firm, in columns 1 and 6; a female outsider (without such position) in columns 2 and 7; a male insider, in columns 3 and 8; a male outsider, in columns 4 and 9; or any insider of either gender, in columns 5 and 10. Robust standard errors clustered at the firm level.
+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 6. Effects of the Quota on New Top Executive Appointments of Connected and Unconnected Outsiders

	Female		Male		Any	Female		Male		Any
	Connected	Unconnected	Connected	Unconnected	Connected	Connected	Unconnected	Connected	Unconnected	Connected
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
No Female * Targeted * Post	0.078	0.188*	-0.0178	-0.239*	0.0602	0.0724	0.230**	-0.00172	-0.294**	0.0707
	(0.0497)	(0.0766)	(0.0835)	(0.0981)	(0.0988)	(0.0488)	(0.0731)	(0.0751)	(0.0930)	(0.0896)
Has Female * Targeted * Post	-0.0396	0.0158	0.0956	-0.0919	0.056	0.0563	0.068	-0.0509	-0.0289	0.00545
	(0.0466)	(0.0660)	(0.0983)	(0.0980)	(0.1010)	(0.0368)	(0.0511)	(0.0620)	(0.0753)	(0.0668)
Observations	1,576	1,576	1,576	1,576	1,576	2,521	2,521	2,521	2,521	2,521
Firms	437	437	437	437	437	573	573	573	573	573
R^2	0.109	0.181	0.122	0.145	0.118	0.0687	0.106	0.0611	0.076	0.0548
Dep. Var. Mean	0.0412	0.0793	0.224	0.414	0.265	0.0543	0.0766	0.25	0.342	0.304
Fixed Effects										
Month	X	X	X	X	X	X	X	X	X	X
Firm	X	X	X	X	X	X	X	X	X	X
Control group	Germany	Germany	Germany	Germany	Germany	Europe	Europe	Europe	Europe	Europe

Notes: The unit of observation is an appointment of a new top executive (i.e., executive director). The outcome variables are indictors for the new top executive being a female connected outsider, who had a prior network connection with a prior top executive at the firm, in columns 1 and 6; a female unconnected outsider in columns 2 and 7; a male connected outsider, in columns 3 and 8; a male unconnected outsider, in columns 4 and 9; or an connected outsider of either gender, in columns 5 and 10. The sample is limited to appointments for which complete data are available on potential network connections. Robust standard errors clustered at the firm level.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7. Effects of the Quota on New Top Executive Appointments by Prior Top Executive Experience at a Public Company

	Female		Male		Any	Female		Male		Any
Prior Top Executive	Yes	No	Yes	No	Yes	Yes	No	Yes	No	Yes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
No Female * Targeted * Post	0.0376	0.357***	-0.0449	-0.350***	-0.00734	0.0349	0.393***	-0.0749	-0.353***	-0.0400
	(0.0337)	(0.0842)	(0.0756)	(0.0919)	(0.0803)	(0.0345)	(0.0813)	(0.0687)	(0.0803)	(0.0733)
Has Female * Targeted * Post	0.00652	0.0340	-0.0573	0.0168	-0.0508	-0.00318	0.187**	-0.0651	-0.119	-0.0683
	(0.0285)	(0.0818)	(0.0684)	(0.105)	(0.0746)	(0.0268)	(0.0588)	(0.0510)	(0.0765)	(0.0593)
Observations	1,606	1,606	1,606	1,606	1,606	2,527	2,527	2,527	2,527	2,527
Firms	445	445	445	445	445	584	584	584	584	584
R^2	0.136	0.203	0.0903	0.147	0.0754	0.0807	0.127	0.0541	0.09	0.0503
Dep. Var. Mean	0.0168	0.144	0.155	0.684	0.172	0.0222	0.155	0.157	0.665	0.18
Fixed Effects										
Month	X	X	X	X	X	X	X	X	X	X
Firm	X	X	X	X	X	X	X	X	X	X
Control group	Germany	Germany	Germany	Germany	Germany	Europe	Europe	Europe	Europe	Europe

Notes: The unit of observation is an appointment of a new top executive (i.e., executive director). The outcome variables are indictors for the new top executive being a woman with prior top executive experience at a public company at the time of their appointment, in columns 1 and 6; a woman without such experience, in columns 2 and 7; a man with prior top executive experience, in columns 3 and 8; a man without such experience, in columns 4 and 9; or a person of either gender with prior top executive experience, in columns 5 and 10. The sample is limited to appointments for which data are available on prior work histories. Robust standard errors clustered at the firm level.

+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 8. Effects of the Quota on Counts of Top Executives by Gender

	Total Count of Top Executives		Number of Female Top Executives		Number of Male Top Executives	
	(1)	(2)	(3)	(4)	(5)	(6)
Targeted * Post	0.141	0.0871	0.386***	0.355***	-0.245*	-0.268*
	(0.1090)	(0.1110)	(0.0635)	(0.0651)	(0.1110)	(0.1120)
Observations	46,841	58,323	46,841	58,323	46,841	58,323
Firms	624	747	624	747	624	747
R^2	0.00527	0.00563	0.146	0.0973	0.0221	0.0123
Dep. Var. Mean	3.28	3.86	0.28	0.445	3.000	3.416
Fixed Effects						
Month	X	X	X	X	X	X
Firm	X	X	X	X	X	X
Control group	Germany	Europe	Germany	Europe	Germany	Europe

Notes: Unit of observation is a company-month. The outcome is the first two columns is the total count of top executives (i.e., executive directors). The later columns examine counts of female (columns 3 and 4) and male (columns 5 and 6) top executives. Robust standard errors clustered at the firm level.

+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 9. Stock Market Event Study Excess Return Associated with Key News Events About the Quota's Announement

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Germany								
Targeted * Event 1	-0.041***	-0.028***	-0.033***	-0.038***	-0.038***	-0.009***	-0.054***	-0.059***
	(0.005)	(0.004)	(0.005)	(0.005)	(0.003)	(0.002)	(0.006)	(0.010)
Targeted * Event 2	0.025***	0.017***	0.016***	0.018***	0.017***	0.009***	0.008	-0.011
	(0.005)	(0.003)	(0.003)	(0.003)	(0.002)	(0.001)	(0.004)	(0.011)
Targeted * Event 3	0.010*	0.002	0.004	0.001	0.000	0.011***	-0.005	-0.014
	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.005)	(0.013)
Observations	602	602	602	549	602	600	604	610
R^2	0.02	0.75	0.78	0.77	0.83	0.78	0.79	0.79
Panel B: Europe								
Targeted * Event 1	-0.027***	-0.018***	-0.026***	-0.030***	-0.029***	-0.006***	-0.044***	-0.051***
	(0.005)	(0.003)	(0.004)	(0.005)	(0.003)	(0.002)	(0.005)	(0.008)
Targeted * Event 2	0.023***	0.017***	0.016***	0.017***	0.016***	0.014***	0.017***	0.002
	(0.005)	(0.002)	(0.002)	(0.003)	(0.002)	(0.001)	(0.004)	(0.009)
Targeted * Event 3	0.018***	0.010***	0.014***	0.009*	0.009**	0.013***	-0.002	-0.020
	(0.005)	(0.002)	(0.002)	(0.004)	(0.003)	(0.001)	(0.005)	(0.010)
Observations	592	592	592	539	592	590	594	600
R^2	0.02	0.82	0.85	0.76	0.84	0.85	0.85	0.86
Controls								
Ex Mkt Rtn		X	X	X	X	X	X	X
Ex Mkt Rtn[t-1]			X	X	X	X	X	X
Ex Mkt Rtn[t-2]			X	X	X	X	X	X
Window period	(-1, 1)	(-1,1)	(-1,1)	(-1,1)	(-1,1)	(-0,0)	(-2,2)	(-5,5)
Control index		FTSE Europe	FTSE Europe	S&P VW	MSCI World	FTSE Europe	FTSE Europe	FTSE Europe

Notes: Results from stock market event study analysis of three key new events in the development of the German gender quota law. Event 1 is on October 28, 2020, the publication date of the German federal government report (showing that voluntary targets were not effective and) calling for greater public intervention to increase gender diversity among top executives. Event 2 is on November 22, 2020, the annoucement date of the coalition government's agreement to introduce a gender quota for top executives. Event 3 is on January 6, 2021, when the text of the draft law was released. Robust standard errors clustered at the firm level.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 10. Effects of the Quota on Firm Value

	(1)	(2)	(3)	(4)
Targeted * Post Report	-0.232*	-0.239*	-0.102	-0.0952
	(0.0898)	(0.0963)	(0.0676)	(0.0715)
Targeted * Post Passage	0.335***	0.350***	0.141*	0.142*
	(0.0767)	(0.0818)	(0.0597)	(0.0630)
Pr(Report + Pass)=0	0.225	0.215	0.583	0.525
Observations	10,008	7,665	15,066	12,439
Firms	552	294	707	466
R^2	0.0819	0.0938	0.0651	0.0665
Dep. Var. Mean	1.871	1.827	1.802	1.761
Fixed Effects				
Month	X	X	X	X
Firm	X	X	X	X
Control group	Germany	Germany	Europe	Europe
Sample	All	Quarterly	All	Quarterly

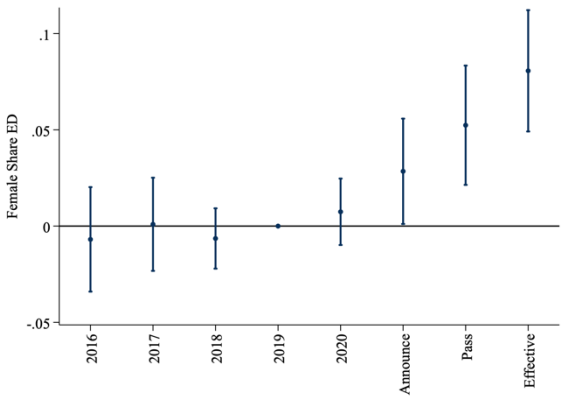
Notes: Unit of observation is a financial report for a firm. Reporting frequencies can be quarterly, semi-annual, and annual. The samples in columns 1 and 3 include all frequencies; columns 2 and 4 are limited to quarterly reports. The outcome variable is the ratio between the firm's market value and the value of its assets (Tobin's Q) at the time of the report. Robust standard errors clustered at the firm level.
+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 11. Effects of the Quota on Quarterly Operating Profit / Total Assets

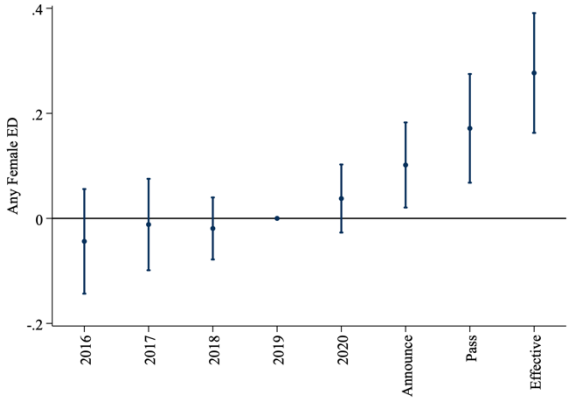
	(1)	(2)	(3)	(4)
Targeted * Post Report	-0.742	0.0802	1.318	1.502
	(2.208)	(2.561)	(1.844)	(1.996)
Targeted * Post Passage	1.611	1.140	-2.108	-1.584
	(2.120)	(2.470)	(1.825)	(2.006)
Pr(Report + Pass)=0	0.656	0.586	0.658	0.968
Observations	10,057	7,668	15,079	12,433
Firms	557	295	707	466
R^2	0.0278	0.0253	0.0284	0.0243
Dep. Var. Mean	8.384	8.899	13.93	14.58
Fixed Effects				
Month	X	X	X	X
Firm	X	X	X	X
Control group	Germany	Germany	Europe	Europe
Sample	All	Quarterly	All	Quarterly

Notes: Unit of observation is a financial report for a firm. The outcome variable is the ratio between the firm's operating profit in the quarter and the value of its assets at the time of the report. Reporting frequencies can be quarterly, semi-annual, and annual. The samples in columns 1 and 3 include all frequencies; columns 2 and 4 are limited to quarterly reports. In columns 1 and 3, the outcome variable is normalized to match a quarterly level by taking one half of the value for semi-annual reports and one quarter of the value for annual reports. Robust standard errors clustered at the firm level.
+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Figure A1: Timing of Changes in Female Representation Among Top Executives Before and After the Quota's Adoption, Excluding French Firms



Panel A: Female Share



Panel B: Any Female

Notes: The figures plot difference-in-differences estimates and 95% confidence intervals for relative changes in the average share of female top executives in the years before and time periods after the three key quota events (being announced, passed, and taking effect) in Panel A and in the share of companies with any female top executive in Panel B. The models include firm and year fixed effects and use robust standard errors clustered at the firm level. Both figures use large public companies with dual boards across Europe, but excluding France, which adopted a quota for top executives soon after the German quota, for the control group. An observation is a company-month between January 2016 and May 2024.

Table A1. Timing of the Effects of the Quota on Female Representation Among Top Executives

	Female Share of Top Executives		Any Female Top Executives	
	(1)	(2)	(3)	(4)
Targeted * Period Post Announcement	0.0330*	0.0277*	0.123**	0.103*
	(0.0140)	(0.0136)	(0.0417)	(0.0413)
Targeted * Period Post Passage	0.0512**	0.0536***	0.190***	0.179***
	(0.0156)	(0.0153)	(0.0513)	(0.0513)
Targeted * Post Effective Date	0.0750***	0.0817***	0.292***	0.285***
	(0.0152)	(0.0148)	(0.0535)	(0.0532)
Observations	46,841	58,323	46,841	58,323
Firms	624	747	624	747
R^2	0.0999	0.081	0.112	0.0916
Dep. Var. Mean	0.0734	0.103	0.24	0.343
Fixed Effects				
Month	X	X	X	X
Firm	X	X	X	X
Control group	Germany	Europe	Germany	Europe

Notes: Estimates in this table are from the same model as those in Table 2, except here the Post period is split into three parts: following the announcement, following the passage, and following the effective date of the quota. Robust standard errors clustered at the firm level.
+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table A2. Effects of the Quota on the Gender of Top Executive Appointments

	Woman Appointed					
	(1)	(2)	(3)	(4)	(5)	(6)
Targeted * Post	0.121*			0.131**		
	(0.0497)			(0.0429)		
No Female * Targeted * Post		0.280***	0.285***		0.284***	0.282***
		(0.0728)	(0.0724)		(0.0741)	(0.0739)
Has Female * Targeted * Post		-0.0323	-0.0626		0.0500	0.0483
		(0.0576)	(0.0601)		(0.0486)	(0.0486)
No Female	0.0717+	0.144**	0.158***	0.0826**	0.101***	0.104***
	(0.0435)	(0.0435)	(0.0455)	(0.0273)	(0.0279)	(0.0283)
No Female * Targeted	0.106+	-0.0552	-0.0692	0.0666	-0.0275	-0.0291
	(0.0608)	(0.0691)	(0.0716)	(0.0506)	(0.0578)	(0.0579)
No Female * Post	0.110*	-0.00143	-0.0326	0.107***	0.0663*	0.0595+
	(0.0440)	(0.0491)	(0.0512)	(0.0308)	(0.0334)	(0.0339)
Female Share Senior Leadership			0.135*			0.149*
			(0.0667)			(0.0587)
Female Share Supervisory			0.224*			0.0564
			(0.108)			(0.0882)
Pr(Equal Effects)		< 0.001	< 0.001		0.00503	0.00523
Observations	2,545	2,545	2,336	3,920	3,920	3,841
Firms	477	477	417	632	632	623
R^2	0.105	0.111	0.118	0.0583	0.0612	0.0641
Dep. Var. Mean	0.142	0.142	0.147	0.159	0.159	0.159
Fixed Effects						
Month	X	X	X	X	X	X
Firm	X	X	X	X	X	X
Control group	Germany	Germany	Germany	Europe	Europe	Europe

Notes: Unit of observation is a top executive (ED) appointment. The sample of appointments includes both new top executives (examined in Table 4) and new roles for continuing EDs. The outcome variable is an indictor for the new top executive being female. The indicators for No Female and Has Female, as well as the measures of Female Share Senior Leadership (below the top executive, or ED, level) and Female Share Supervisory (for non-executive supervisory board members), are set at the company level at the start of the month prior to the appointment start date. Robust standard errors clustered at the firm level.

+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table A3. Effects of the Quota on New Top Executive Appointments of Employment-Connected and Unconnected Outsiders

	Female		Male		Any	Female		Male		Any
	Connected	Unconnected	Connected	Unconnected	Connected	Connected	Unconnected	Connected	Unconnected	Connected
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
No Female * Targeted * Post	0.0772	0.187*	-0.00574	-0.246**	0.0714	0.0678	0.226**	0.00976	-0.283**	0.0776
	(0.0498)	(0.0766)	(0.0785)	(0.0949)	(0.0946)	(0.0491)	(0.0750)	(0.0723)	(0.0913)	(0.0882)
Has Female * Targeted * Post	-0.0379	0.0185	0.0930	-0.0902	0.0551	0.0564	0.0795	-0.0830	-0.0496	-0.0266
	(0.0467)	(0.0658)	(0.0958)	(0.0961)	(0.0993)	(0.0385)	(0.0524)	(0.0674)	(0.0763)	(0.0736)
Observations	1,571	1,571	1,571	1,571	1,571	2,430	2,430	2,430	2,430	2,430
Firms	437	437	437	437	437	568	568	568	568	568
R^2	0.11	0.182	0.118	0.15	0.115	0.0683	0.103	0.0607	0.0781	0.0566
Dep. Var. Mean	0.0414	0.0796	0.22	0.418	0.261	0.0531	0.0774	0.243	0.344	0.296
Fixed Effects										
Month	X	X	X	X	X	X	X	X	X	X
Firm	X	X	X	X	X	X	X	X	X	X
Control group	Germany	Germany	Germany	Germany	Germany	Europe	Europe	Europe	Europe	Europe

Notes: The unit of observation is an appointment of a new top executive (i.e., executive director). The outcome variables are indictors for the new top executive being a female connected outsider, who had a prior network connection with a prior top executive at the firm, in columns 1 and 6; a female unconnected outsider in columns 2 and 7; a male connected outsider, in columns 3 and 8; a male unconnected outsider, in columns 4 and 9; or an connected outsider of either gender, in columns 5 and 10. The sample is limited to appointments for which complete data are available on potential network connections. Robust standard errors clustered at the firm level.

+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table A4. Limiting Network Connections to the CEO

	Female		Male		Any	Female		Male		Any
	Connected	Unconnected	Connected	Unconnected	Connected	Connected	Unconnected	Connected	Unconnected	Connected
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
No Female * Targeted * Post	0.0725	0.194*	-0.0444	-0.212*	0.0281	0.0864+	0.216**	-0.0614	-0.234*	0.0251
	(0.0474)	(0.0775)	(0.0683)	(0.0983)	(0.0845)	(0.0463)	(0.0757)	(0.0590)	(0.0929)	(0.0739)
Has Female * Targeted * Post	0.0133	-0.0371	0.104	-0.100	0.117	0.0569+	0.0673	-0.0133	-0.0665	0.0437
	(0.0364)	(0.0685)	(0.0824)	(0.0996)	(0.0830)	(0.0341)	(0.0542)	(0.0570)	(0.0892)	(0.0652)
Observations	1,576	1,576	1,576	1,576	1,576	2,521	2,521	2,521	2,521	2,521
Firms	437	437	437	437	437	573	573	573	573	573
R^2	0.1	0.179	0.103	0.139	0.102	0.0594	0.0987	0.0582	0.0846	0.0562
Dep. Var. Mean	0.0298	0.0907	0.141	0.497	0.171	0.0333	0.0976	0.14	0.451	0.173
Fixed Effects										
Month	X	X	X	X	X	X	X	X	X	X
Firm	X	X	X	X	X	X	X	X	X	X
Control group	Germany	Germany	Germany	Germany	Germany	Europe	Europe	Europe	Europe	Europe

Notes: The unit of observation is an appointment of a new top executive (i.e., executive director). The outcome variables are indictors for the new top executive being a female CEO-connected outsider, who had a prior network connection with the firm's CEO, in columns 1 and 6; a female CEO-unconnected outsider in columns 2 and 7; a male CEO-connected outsider, in columns 3 and 8; a male CEO-unconnected outsider, in columns 4 and 9; or a CEO-connected outsider of either gender, in columns 5 and 10. Robust standard errors clustered at the firm level.

+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table A5. Expanding Network Connections to Include Top Executives and Supervisory Board Members

	Female		Male		Any	Female		Male		Any
	Connected	Unconnected	Connected	Unconnected	Connected	Connected	Unconnected	Connected	Unconnected	Connected
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
No Female * Targeted * Post	0.102+	0.161*	-0.00574	-0.199*	0.0497	0.104+	0.190**	0.00976	-0.261**	0.0917
	(0.0578)	(0.0733)	(0.0785)	(0.0872)	(0.108)	(0.0548)	(0.0725)	(0.0723)	(0.0817)	(0.102)
Has Female * Targeted * Post	-0.0232	0.00379	0.0930	-0.0787	0.0583	0.0677+	0.0682	-0.0830	-0.0562	-0.00863
	(0.0486)	(0.0611)	(0.0958)	(0.0937)	(0.104)	(0.0374)	(0.0501)	(0.0674)	(0.0694)	(0.0804)
Observations	1,571	1,571	1,571	1,571	1,571	2,430	2,430	2,430	2,430	2,430
Firms	437	437	437	437	437	568	568	568	568	568
R^2	0.122	0.179	0.118	0.138	0.106	0.0705	0.0935	0.0607	0.0743	0.0634
Dep. Var. Mean	0.0528	0.0681	0.22	0.352	0.338	0.0663	0.0642	0.243	0.265	0.389
Fixed Effects										
Month	X	X	X	X	X	X	X	X	X	X
Firm	X	X	X	X	X	X	X	X	X	X
Control group	Germany	Germany	Germany	Germany	Germany	Europe	Europe	Europe	Europe	Europe

Notes: The unit of observation is an appointment of a new top executive (i.e., executive director). The outcome variables are indictors for the new top executive being a female connected outsider, who had a prior network connection with a prior top executive or supervisory board member at the firm, in columns 1 and 6; a female unconnected outsider in columns 2 and 7; a male connected outsider, in columns 3 and 8; a male unconnected outsider, in columns 4 and 9; or an connected outsider of either gender, in columns 5 and 10. The sample is limited to appointments for which complete data are available on potential network connections. Robust standard errors clustered at the firm level.

+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table A6. Including Top Executive Appointments with Missing Network Information

	Female		Male		Any	Female		Male		Any
	Connected	Unconnected	Connected	Unconnected	Connected	Connected	Unconnected	Connected	Unconnected	Connected
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
No Female * Targeted * Post	0.0702	0.187*	-0.0216	-0.215*	0.0485	0.0717	0.220**	0.00923	-0.281**	0.0809
	(0.0477)	(0.0740)	(0.0789)	(0.0946)	(0.0922)	(0.0466)	(0.0713)	(0.0722)	(0.0909)	(0.0852)
Has Female * Targeted * Post	-0.0336	0.0000207	0.0978	-0.113	0.0642	0.0691*	0.0623	-0.0457	-0.0775	0.0234
	(0.0453)	(0.0629)	(0.0948)	(0.0951)	(0.0978)	(0.0349)	(0.0485)	(0.0565)	(0.0730)	(0.0610)
Observations	1,629	1,629	1,629	1,629	1,629	2,625	2,625	2,625	2,625	2,625
Firms	446	446	446	446	446	588	588	588	588	588
R^2	0.109	0.182	0.122	0.142	0.118	0.07	0.104	0.0617	0.0727	0.0563
Dep. Var. Mean	0.0411	0.0798	0.223	0.412	0.264	0.0537	0.0781	0.246	0.345	0.3
Fixed Effects										
Month	X	X	X	X	X	X	X	X	X	X
Firm	X	X	X	X	X	X	X	X	X	X
Control group	Germany	Germany	Germany	Germany	Germany	Europe	Europe	Europe	Europe	Europe

Notes: The unit of observation is an appointment of a new top executive (i.e., executive director). The outcome variables are indictors for the new top executive being a female connected outsider, who had a prior network connection with a prior top executive at the firm, in columns 1 and 6; a female unconnected outsider in columns 2 and 7; a male connected outsider, in columns 3 and 8; a male unconnected outsider, in columns 4 and 9; or an connected outsider of either gender, in columns 5 and 10. This analysis uses the full sample of appointments and treats people with missing connection data as being unconnected. Robust standard errors clustered at the firm level.

+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table A7. Effects of the Quota on New Top Executive Appointments by Prior Top Executive Experience

	Female		Male		Any	Female		Male		Any
Prior Top Executive	Yes	No	Yes	No	Yes	Yes	No	Yes	No	Yes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
No Female * Targeted * Post	0.185*	0.210*	-0.244**	-0.151+	-0.0592	0.197**	0.230**	-0.263**	-0.165+	-0.0653
	(0.0725)	(0.0829)	(0.0898)	(0.0915)	(0.0956)	(0.0720)	(0.0799)	(0.0836)	(0.0846)	(0.0856)
Has Female * Targeted * Post	0.0794	-0.0389	0.0690	-0.110	0.148	0.0991**	0.0847	-0.0392	-0.144+	0.0598
	(0.0482)	(0.0783)	(0.0943)	(0.102)	(0.0997)	(0.0379)	(0.0522)	(0.0745)	(0.0779)	(0.0786)
Observations	1,606	1,606	1,606	1,606	1,606	2,527	2,527	2,527	2,527	2,527
Firms	445	445	445	445	445	584	584	584	584	584
R^2	0.15	0.18	0.114	0.117	0.0918	0.0727	0.106	0.07	0.0685	0.053
Dep. Var. Mean	0.0529	0.108	0.364	0.474	0.417	0.0617	0.116	0.376	0.447	0.437
Fixed Effects										
Month	X	X	X	X	X	X	X	X	X	X
Firm	X	X	X	X	X	X	X	X	X	X
Control group	Germany	Germany	Germany	Germany	Germany	Europe	Europe	Europe	Europe	Europe

Notes: The unit of observation is an appointment of a new top executive (i.e., executive director). The outcome variables are indictors for the new top executive being a woman with prior top executive experience at a public or private company at the time of their appointment, in columns 1 and 6; a woman without such experience, in columns 2 and 7; a man with prior top executive experience, in columns 3 and 8; a man without such experience, in columns 4 and 9; or a person of either gender with prior top executive experience, in columns 5 and 10. The sample is limited to appointments for which data are available on prior work histories. Robust standard errors clustered at the firm level.
+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table A8. Effects of the Quota on New Top Executive Appointments by Top Executive or Supervisory Board Experience

	Female		Male		Any	Female		Male		Any
Prior Top Leaderhip Experiecne	Yes	No	Yes	No	Yes	Yes	No	Yes	No	Yes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
No Female * Targeted * Post	0.297***	0.0979	-0.365***	-0.0301	-0.0678	0.284***	0.144*	-0.338***	-0.0896	-0.0539
	(0.0762)	(0.0707)	(0.0863)	(0.0728)	(0.0844)	(0.0735)	(0.0684)	(0.0832)	(0.0696)	(0.0790)
Has Female * Targeted * Post	0.0284	0.0121	0.0142	-0.0547	0.0426	0.0742	0.110**	-0.186*	0.00197	-0.112
	(0.0640)	(0.0576)	(0.0994)	(0.103)	(0.100)	(0.0564)	(0.0400)	(0.0804)	(0.0787)	(0.0755)
Observations	1,606	1,606	1,606	1,606	1,606	2,527	2,527	2,527	2,527	2,527
Firms	445	445	445	445	445	584	584	584	584	584
R^2	0.161	0.155	0.14	0.107	0.102	0.0967	0.0796	0.093	0.0606	0.0603
Dep. Var. Mean	0.0834	0.0778	0.462	0.377	0.545	0.106	0.0708	0.509	0.314	0.615
Fixed Effects										
Month	X	X	X	X	X	X	X	X	X	X
Firm	X	X	X	X	X	X	X	X	X	X
Control group	Germany	Germany	Germany	Germany	Germany	Europe	Europe	Europe	Europe	Europe

Notes: The unit of observation is an appointment of a new top executive (i.e., executive director). The outcome variables are indictors for the new top executive being a woman with prior top leadership experience (as a top executive or board member) at the time of their appointment, in columns 1 and 6; a woman without such experience, in columns 2 and 7; a man with prior top leadership experience, in columns 3 and 8; a man without such experience, in columns 4 and 9; or a person of either gender with prior top leadership experience, in columns 5 and 10. The sample is limited to appointments for which data are available on prior work histories. Robust standard errors clustered at the firm level.
+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table A9. Summary Statistics on Top Executive Roles at Targeted Firms in 2019

	Any Top Executive in Role	Any Female Top Executive in Role	Share Female in Role
Role:			
CEO	1.00	0.06	0.06
CFO	0.94	0.09	0.10
Human Resources	0.55	0.24	0.43
COO	0.36	0.01	0.04
Division CEO	0.21	0.03	0.14
Sales	0.22	0.04	0.20
Technology	0.21	0.01	0.07
Other Less Common Roles	0.49	0.07	0.15
Deputy CEO	0.13	0.00	0.00
Other Divisional Roles	0.10	0.00	0.00
Marketing	0.09	0.01	0.17
IT	0.09	0.01	0.17
Legal	0.09	0.06	0.67
Risk	0.06	0.00	0.00
Unknown Role	0.54	0.15	0.28

Notes: Summary statistics are presented for companies targeted by the quota in 2019, the year before the quota's annoucement. Individual executives whose job title includes multiple fuctional roles are counted in each of these roles. Less common roles also include specific job titles outside of the list above, while unknown roles do not specify a function (e.g., "Executive Director").

Table A10. Estimated Effects of the Quota on Firm Value in Models with Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Targeted * Post Report	-0.264**	-0.283**	-0.273**	-0.282**	-0.0590	-0.0850	-0.0451	-0.0637
	(0.0860)	(0.0903)	(0.0919)	(0.0948)	(0.0657)	(0.0691)	(0.0687)	(0.0711)
Targeted * Post Passage	0.307***	0.324***	0.320***	0.333***	0.162**	0.174**	0.165**	0.174**
	(0.0752)	(0.0742)	(0.0807)	(0.0802)	(0.0581)	(0.0578)	(0.0610)	(0.0610)
Ln(Assets)		-0.651***		-0.531**		-0.541***		-0.418***
		(0.124)		(0.168)		(0.118)		(0.102)
Pr(Report + Pass)=0	0.563	0.586	0.543	0.518	0.123	0.181	0.0772	0.101
Observations	10,008	10,008	7,665	7,665	15,066	15,066	12,439	12,439
Firms	552	552	294	294	707	707	466	466
R^2	0.119	0.163	0.132	0.159	0.114	0.153	0.121	0.146
Dep. Var. Mean	1.871	1.871	1.827	1.827	1.802	1.802	1.761	1.761
Fixed Effects								
Quarter by periodicity	X	X	X	X	X	X	X	X
Firm	X	X	X	X	X	X	X	X
Sector linear trends	X	X	X	X	X	X	X	X
Control group	Germany	Germany	Germany	Germany	Europe	Europe	Europe	Europe
Sample	All	All	Quarterly	Quarterly	All	All	Quarterly	Quarterly

Notes: Unit of observation is a financial report for a firm. Reporting periodicity can be quarterly, semi-annual, and annual. The samples in columns 1 and 3 include all frequencies; columns 2 and 4 are limited to quarterly reports. The outcome variable is the ratio between the firm's market value and the value of its assets (Tobin's Q) at the time of the report. Robust standard errors clustered at the firm level.
+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table A11. Estimated Effects of the Quota on Quarterly Operating Profit / Total Assets in Models with Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Affected * Post Report	-1.952	-1.701	-1.531	-1.321	1.710	1.697	2.033	1.962
	(2.158)	(2.147)	(2.511)	(2.501)	(1.829)	(1.832)	(1.993)	(2.000)
Affected * Post Passage	0.777	0.539	0.290	0.0117	-2.057	-2.052	-1.506	-1.473
	(2.152)	(2.156)	(2.480)	(2.472)	(1.897)	(1.898)	(2.087)	(2.090)
Ln(Assets)		8.985**		11.76*		-0.267		-1.584
		(3.190)		(5.628)		(2.338)		(3.184)
Pr(Report + Pass)=0	0.532	0.55	0.562	0.558	0.856	0.853	0.811	0.824
Observations								
Firms	10,057	10,057	7,668	7,668	15,079	15,079	12,433	12,433
R^2	557	557	295	295	707	707	466	466
Dep. Var. Mean	0.0488	0.057	0.0463	0.0557	0.0482	0.0482	0.0452	0.0455
	8.384	8.384	8.899	8.899	13.93	13.93	14.58	14.58
Fixed Effects								
Quarter by periodicity	X	X	X	X	X	X	X	X
Firm	X	X	X	X	X	X	X	X
Sector linear trends	X	X	X	X	X	X	X	X
Control group	Germany	Germany	Germany	Germany	Europe	Europe	Europe	Europe
Sample	All	All	Quarterly	Quarterly	All	All	Quarterly	Quarterly

Notes: Unit of observation is a financial report for a firm. The outcome variable is the ratio between the firm's operating profit in the quarter and the value of its assets at the time of the report. Reporting periodicity can be quarterly, semi-annual, and annual. The samples in columns 1 and 3 include all frequencies; columns 2 and 4 are limited to quarterly reports. In columns 1 and 3, the outcome variable is normalized to match a quarterly level by taking one half of the value for semi-annual reports and one quarter of the value for annual reports. Robust standard errors clustered at the firm level.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$